



The Impact of Atrial Fibrillation on Quality of Life

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A Call To Action For Atrial Fibrillation



A LETTER FROM THE AUTHOR

Atrial fibrillation (AFib) is the most common sustained cardiac arrhythmia observed in primary healthcare practice. AFib has serious health consequences, including increased risk for stroke, development of congestive heart failure, and death. The overarching goals of therapy for AFib are immediate control of cardiac rate and restoration of sinus rhythm, suppression of AFib symptoms, reduction of thromboembolic risk, preservation or improvement of left ventricular function, improvement in exercise capacity and hemodynamic function, prevention of tachycardia-induced cardiomyopathy, and enhancement of quality of life (QOL).

AFib can have a negative impact on patient QOL that ranges from little or no impairment to severe impairment. On average, QOL in AFib patients is significantly worse than in age- and sex-matched controls. However, because the current medical literature on QOL is based on data from clinical trials or from tertiary care clinics, the extent and impact of diminished QOL among patients with AFib in the general community is not well understood. In addition, the best way to measure QOL in AFib patients is not clear, since QOL is largely subjective and based on patient self-assessments of multiple domains in questionnaires like the Short Form-36 or other QOL instruments. This monograph presents physicians and other healthcare providers with a fundamental overview of the impact of AFib on patient QOL, the various patient and disease factors that affect QOL, and the clinical trial results demonstrating that effective management of AFib in general and maintenance of sinus rhythm in particular, can improve certain physical and mental aspects of QOL during the course of therapy.

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Dr. Dorian's research interests include basic science research in advanced cardiac life support, ventricular fibrillation, defibrillation, the clinical pharmacology of antiarrhythmic drugs, and clinical research on implanted devices, antiarrhythmic drugs and quality of life in patients with arrhythmias. He has recently completed a clinical trial in out-of-hospital cardiac arrest and continues collaborative trials in pre-hospital care and resuscitation.

SUMMARY

Atrial fibrillation (AFib) represents a significant public health burden. It is estimated that more than 2.3 million people in the United States have this condition, which can present with a wide range of symptoms that may have a substantial negative impact on quality of life (QOL). Treatments for AFib and treatment concerns can also impair QOL.¹ Observational and interventional studies have shown that AFib can negatively affect all QOL domains (eg, social, physical, emotional, economic). Numerous clinical trials have demonstrated that both pharmacologic and ablative intervention may improve QOL in patients with AFib. No single treatment approach, however, is clearly more effective at improving QOL than any other alternative. Successful conversion and maintenance of normal sinus rhythm can markedly improve QOL in patients with AFib, but the benefits associated with normal sinus rhythm may be blunted by the adverse effects of the drugs or surgical intervention used to achieve it. Patients with AFib would benefit from the development of markers that might identify those most likely to realize QOL improvements and experience minimal adverse effects with specific therapies for this condition.

INTRODUCTION

Atrial fibrillation (AFib) represents a significant public health burden. It is estimated that more than 2.3 million people in the United States have this condition.¹

It is the most common arrhythmia in clinical practice and accounts for approximately one third of hospitalizations for cardiac rhythm disturbances.^{2,3} Numerous studies have suggested that, on average, patients with AFib have significantly reduced quality of life (QOL) relative to the general population.^{4,5} The range of QOL impairment varies widely: in some patients, AFib is completely asymptomatic, and in others QOL is very severely impaired. The reduction in QOL in patients with AFib may be similar to that in patients with severe chronic illnesses, such as kidney disease or acute heart failure. However, the importance of decreased QOL associated with AFib and the effectiveness of different treatments with respect to life quality has been debated. Although determination of effects of AFib on QOL and the potential benefits in QOL gained from AFib therapies are important considerations,² many studies addressing QOL have been limited by methodologic weaknesses, including small sample sizes, nonvalidated questionnaires, and highly selected patient populations.⁵ The aim of this monograph is to address several fundamental questions about the relationship between AFib and QOL:

- 1) To what extent is QOL reduced in patients with AFib?
- 2) Which characteristics of patients with AFib are most closely associated with reduced QOL?
- 3) How do different AFib treatments improve QOL?

EFFECTS OF AFIB ON QOL

Results from a large number of observational studies have shown that, on average, patients with AFib have decreased QOL. The extent of QOL impairment varies widely, from no impairment at all to very severe impairment. Most studies that have addressed this issue selected patients from tertiary care practice or those enrolled in clinical trials, and the proportion of diminished QOL among patients with AFib in the general community is not well understood. On average, QOL in AFib patients is significantly worse than in age- and sex-matched controls. A small-scale descriptive

study that included 81 newly diagnosed patients with AFib indicated that their perceptions of both their physical health and their mental health as assessed by the Medical Outcomes Study Short Form 36 (SF-36) were significantly worse than those for the general population.⁴ Reynolds and colleagues also reported that QOL, measured using the generic SF-12 QOL scale, in 963 newly diagnosed patients with AFib was on average 5 units lower than that for the general population.⁶

In QOL studies, a ¼ unit difference in a QOL scale is considered a moderate difference in QOL, and a ½ standard deviation (SD) unit is considered a large QOL difference. Patients with AFib had significantly worse scores across all domains of the SF-36 than healthy individuals ($P<.001$) and were either significantly worse than ($P<.05$) or as impaired as patients undergoing percutaneous transluminal coronary angioplasty (PTCA) or post-myocardial infarction (MI) patients (Table 1).⁷

Table 1. SF-36 QOL Scores for Patients With AFib, Patients With Other Cardiovascular Disease, and Healthy Subjects.⁷

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| SF-36 Scale | AF Patients (n=152) | PTCA Patients ^a (n=69) | PTCA Patients ^b (n=78) | CHF Patients ^c (n=216) | Post MI Patients ^d (n=69) | Healthy Subjects (n=47) |
|----------------------|---------------------|-----------------------------------|-----------------------------------|-----------------------------------|--------------------------------------|-------------------------|
| General health | 54 ± 21 | 51 ± 23 | 65 ± 22† | 47 ± 24† | 59 ± 19† | 78 ± 17† |
| Physical functioning | 68 ± 27 | 60 ± 29 | 76 ± 25† | 48 ± 31† | 70 ± 26 | 88 ± 19† |
| Role physical | 47 ± 42 | 47 ± 45 | 71 ± 39† | 34 ± 40† | 51 ± 39 | 89 ± 28† |
| Vitality | 47 ± 21 | 48 ± 26 | 60 ± 20† | 44 ± 24 | 58 ± 19† | 71 ± 14† |
| Mental health | 68 ± 18 | 74 ± 18 | 75 ± 16† | 75 ± 21† | 76 ± 16† | 81 ± 11† |
| Role emotional | 65 ± 41 | 64 ± 44 | 83 ± 35† | 64 ± 43 | 73 ± 38 | 92 ± 25† |
| Social functioning | 71 ± 28 | 74 ± 29 | 87 ± 21† | 71 ± 33 | 85 ± 21† | 92 ± 14† |
| Bodily pain | 69 ± 19 | 68 ± 17 | 73 ± 27 | 63 ± 31† | 73 ± 25 | 77 ± 15† |

* $P<.05$, compared with AF patients.

† $P<.001$, compared with AF patients.

‡ All values represent raw mean scores ±SD; higher scores represent better quality of life.

^a Patients 6 months after percutaneous transluminal coronary angioplasty, from St. Michael's Hospital, Toronto, Canada.

^b Patients after percutaneous transluminal coronary angioplasty, from Krumholz HM, et al. *Am Heart J.* 1997;134:337-344.

^c Congestive heart failure patients, from Ware JE, Jr. SF-36 Health Survey: Manual and Interpretation Guide. Boston, MA: The Health Institute, New England Medical Center; 1993.

^d Patients with recent myocardial infarction, from Ware JE, Jr. SF-36 Health Survey: Manual and Interpretation Guide. Boston, MA: The Health Institute, New England Medical Center; 1993.

Similarly, a comparison of 73 patients with paroxysmal AFib (3-year history of ≥ 1 paroxysm per week lasting ≥ 2 hours) with matched controls indicated that the patients had significantly lower ($P < .001$) QOL in 4 of the 8 SF-36 subscales, including physical role function, emotional role function, vitality, and general health.⁸ In a study that compared QOL in 154 patients with paroxysmal or persistent AFib versus 49 control subjects, those with AFib had significantly worse scores for all AFib scales (all $P < .003$).⁹

It is important to note that not all observational studies have demonstrated significant AFib-associated reductions in QOL. Howes and colleagues compared 52 elderly patients with chronic AFib with 48 control patients in sinus rhythm using the SF-36. Neither the physical summary score nor the mental summary score of the SF-36 was significantly different between groups.¹⁰

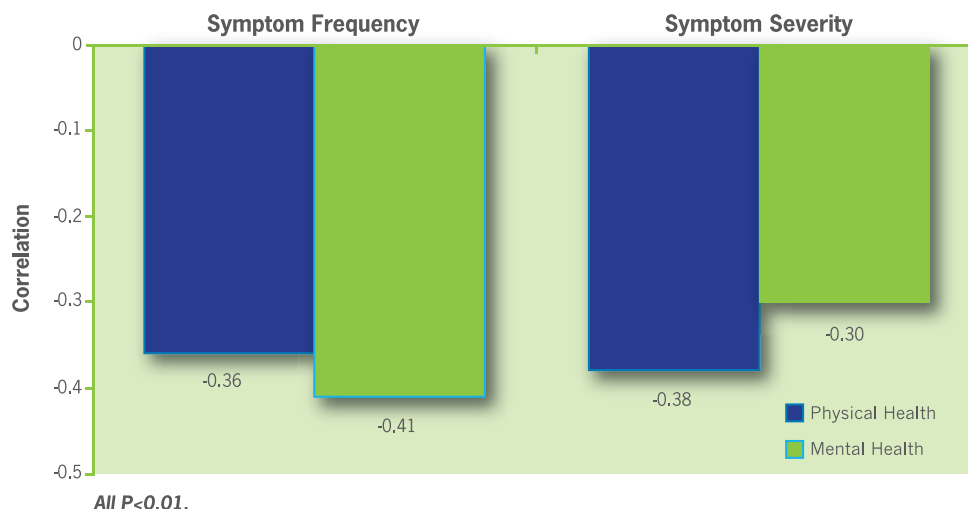
Atrial fibrillation also has the potential to affect QOL because it increases the risk for stroke. Atrial fibrillation is associated with a 4- to 5-fold increase in the risk of embolic stroke, accounting for between 75,000 and 100,000 strokes per year in the United States.¹ Numerous studies have demonstrated that QOL is significantly diminished in stroke survivors.^{11,12}

The best way to measure QOL in AFib patients is not clear. Quality of life is based on individual perceptions and has multiple domains. For most diseases that impair QOL, both “disease specific” and “generic” QOL measures are used to capture the dimensions of life quality that may be affected by the disease and its treatment. The most widely used QOL questionnaires, such as the SF-36, are designed to assess a wide range of domains applicable to many different health states, and these tools have often been used to collect normative data from very large populations. However, these instruments are limited by the fact that they are not disease specific and are likely to be less sensitive to change in patient status than those designed for and validated in individuals with a selected disease or condition.¹³ All of the studies cited above employed the generic SF-36, which has been shown to be less sensitive to AFib severity and recurrence than the disease-specific Arrhythmia Related Symptom Severity Checklist (SSCL).¹⁴ In addition to the SF-36 and SSCL instruments, there are others, including the University of Toronto Atrial Fibrillation Severity Scale (U of T AFSS)¹⁵ and the Canadian Cardiovascular Society (CCS) Severity of Atrial Fibrillation (SAF) Scale.¹⁶

DETERMINANTS OF QOL IN PATIENTS WITH AFIB

Multiple factors influence QOL in patients with AFib. It seems that AFib symptom frequency and severity are strong predictors of QOL in this population, and results from several studies are consistent with this view. It is difficult to disentangle the effect of AFib itself on QOL versus the effect of underlying cardiac or systemic disease. However, in patients with idiopathic (“lone”) paroxysmal AFib not associated with heart disease, symptoms are at least as severe as in patients with structural causes of AFib.¹⁷ An evaluation of AFib-related symptoms with the SCL and QOL with the SF-36 in 81 patients with newly diagnosed AFib indicated significant correlations between symptom severity and frequency and both physical health and mental health (Figure 1). Shortness of breath was closely related to physical health and tiredness to mental health in these patients.⁴ In a separate study, symptom severity, but not frequency or duration of self-reported episodes, was found to be correlated with global QOL impairment.¹⁸

Figure 1. Correlations between symptom frequency and severity and physical and mental health as measured by the SF-36.⁴



Understanding the relationship between symptom severity and QOL in AFib patients is also complicated by the observation that both general health and global life satisfaction are significantly lower in patients with silent AFib versus normal controls.⁹ This study suggests that the underlying disease causing or associated with AFib, rather than symptoms related to the arrhythmia, may itself contribute to poor QOL in these patients. In other studies, patients with no AFib-related symptoms have generic QOL identical to age- and sex-matched controls.¹⁸

Quality of life encompasses the total well-being of the patient and includes both the physical and psychosocial aspects of life. It is likely to be influenced not only by disease symptoms but also by patients' perceptions of how symptoms affect different aspects of their lives. Thus, it might also be expected that a wide range of clinical and demographic variables will influence QOL in AFib patients.¹⁹ For example, results from an evaluation of 963 patients with new-onset AFib enrolled in The Fibrillation Registry Assessing Costs, Therapies, Adverse events and Lifestyle (FRACTAL) study indicated that female sex was strongly associated with higher symptom scores and lower QOL scores. Older patients (>65 years of age) reported less disease-specific impairment in QOL than younger patients.⁶ These findings are consistent with baseline findings from the Canadian Trial of Atrial Fibrillation (CTAF), which showed that female patients reported significantly worse physical health ($P = .002$) and functional capacity ($P < .001$) than male patients. Independent of cardiac disease severity and age, women with AFib had significantly more impaired QOL than men, specifically on domains related to physical rather than emotional functioning.²⁰ Ong and colleagues have also reported that female patients report lower physical, but not mental, QOL than male patients with AFib.²¹

Specific comorbidities may also influence and modulate QOL in patients with AFib. For example, both depression and anxiety are common in patients with AFib, and symptoms of depression and anxiety are both significantly correlated with lower QOL in this population, with symptoms of depression being the strongest predictor of future worse QOL.²² Results from a recent analysis of 122 stroke-free individuals with AFib and 563 subjects without AFib indicated that stroke-free individuals with AFib performed significantly worse than control subjects in tasks of learning and memory ($P < .01$) and attention and executive functions ($P < .01$).²³ While QOL was not evaluated in this study, results from other evaluations in non-AFib patients have indicated that cognitive impairment is associated with decreased QOL.²⁴

IMPROVING EXERCISE CAPACITY, SYMPTOMS, AND QOL IN PATIENTS WITH AFIB: PHARMACOTHERAPY

Studies summarized in the preceding sections have shown that AFib is associated with decreased QOL and that the severity of associated symptoms is a strong determinant of the decline in this parameter. These observations have prompted a large number of investigations aimed at determining whether treatment of AFib significantly improves QOL.

Rhythm and Rate Control With Antiarrhythmic Drugs

The primary objectives for treatment of patients with AFib are to restore and maintain sinus rhythm or to reduce ventricular rate. Several landmark trials have compared these 2 strategies, and results are consistent with the conclusion that appropriate use of either strategy produces improvements in the condition of patients with AFib.

Effects on Symptoms and QOL

The Rate Control Versus Electrical Cardioversion for Persistent Atrial Fibrillation (RACE) study randomly assigned 522 patients with persistent AFib to receive treatment aimed at rate control or rhythm control. Patients in the rate-control group received oral anticoagulant drugs and rate-slowing medication and those in the rhythm-control group underwent serial cardioversions as necessary and received antiarrhythmic and oral anticoagulant drugs.²⁵ At the end of the study, significant improvement ($P < .05$) was noted for 3 of the SF-36 subscales (role limitations due to physical problems, social functioning, and mental health) in the rate-control group. There were no significant changes from baseline to end of study for any SF-36 subscale in the rhythm-control group. Between-group comparison at the end of the study indicated no significant differences between the rhythm- and rate-control strategies in improving QOL.²⁶

The Sotalol-amiodarone Atrial Fibrillation Efficacy Trial (SAFE-T) was a randomized, double-blind, multicenter, placebo-controlled trial in which the effects of sotalol and amiodarone in maintaining sinus rhythm were assessed in 655 patients with persistent AFib who were treated at 20 Veterans Affairs medical centers.²⁷ A substudy of SAFE-T assessed whether maintenance of sinus rhythm was associated with improvements in QOL and/or exercise tolerance.² The investigators evaluated QOL using the SF-36, SCL, Specific Activity Scale, and AFSS and assessed exercise performance using a treadmill test. Restoration of normal sinus rhythm significantly improved both exercise performance and QOL. Improvement from baseline in exercise performance was significantly greater for the patients in sinus rhythm at 8 weeks ($P = .01$) and at 1 year ($P = .02$) compared with those in AFib at these time points. Similarly, improvements in scores for SCL severity, functional capacity, and AFSS symptom burden at 8 weeks and for SCL severity and AFib symptom burden at 1 year were significantly greater (all $P < .05$) for patients who achieved and maintained sinus rhythm versus those with persistent AFib.² In sinus rhythm, exercise capacity and SF-36 scores were significantly positively correlated ($P < .05$) at 1 year for all scales except mental health.²

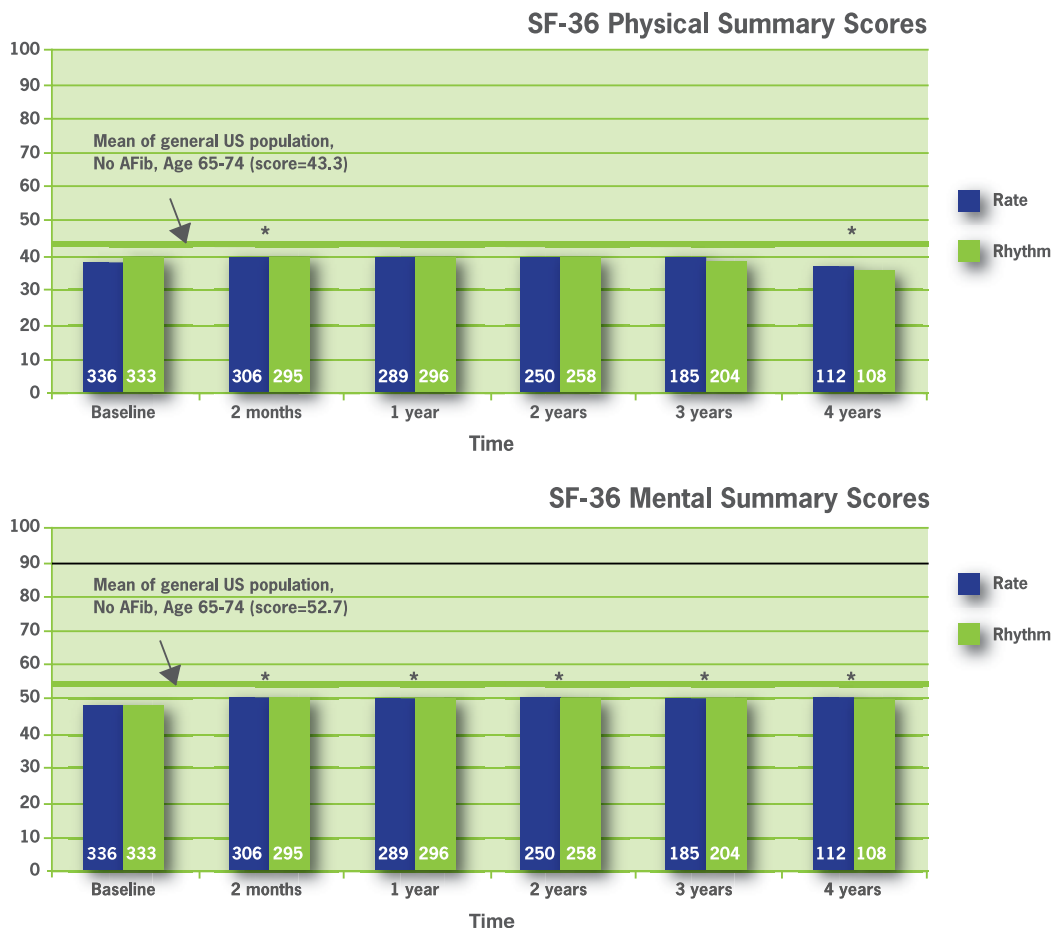
The Atrial Fibrillation Follow-up Investigation of Rhythm Management (AFFIRM) trial was a randomized, multicenter comparison of rate- versus rhythm-control strategies in 4060 patients with AFib.²⁸ Jenkins and colleagues carried out a prespecified substudy of the AFFIRM trial to assess the effects of the 2 treatment strategies on QOL in a total of 716 patients. Instruments used in this evaluation included the Perceived Health scale, the Cantril Ladder of Life, SF-36, the QOL Index, and the SCL: Frequency and Severity. Data were collected during 4 years of follow-up. Quality-of-life scores were similar in rate- and rhythm-control assignment groups at all time points (Figure 2). In addition, QOL scores were similar between patients with sinus rhythm and those with AFib.²⁹

The Canadian Trial of Atrial Fibrillation (CTAF) was a randomized clinical comparison of amiodarone versus either propafenone or sotalol in patients with recent AFib. It included a prospective comprehensive assessment of QOL substudy. Summary measures of both physical and mental health on SF-36 improved significantly with treatment from baseline to 3 months ($P=.001$ and $P=.023$, respectively). Arrhythmia symptom frequency and severity improved significantly from baseline to 3 months (both $P<.001$). Although amiodarone was significantly superior to the other drugs in maintaining sinus rhythm, the QOL improvements on all measures were similar for the amiodarone group and sotalol or propafenone groups. At 3 months, global wellbeing was significantly worse for patients who had recurrent AFib versus those who did not ($P=.04$).¹⁸

The Pharmacological Intervention in Atrial Fibrillation (PIAF) trial randomized 252 patients with symptomatic persistent AFib to ventricular rate control or cardioversion and maintenance of sinus rhythm. Quality of life was assessed with the SF-36 over 1 year of follow-up. At 1 year, 6 of 8 SF-36 items had improved significantly for patients assigned to rate control, and 5 of 8 items for those on rhythm control. The physical component summary showed comparable improvements in the 2 treatment groups ($P=.004$ for rate control and $P<.001$ for rhythm control), but there were no significant improvements for the mental component summary. Both groups had a similar improvement in overall symptoms status.³⁰ Patients treated with amiodarone had better exercise tolerance at 12 weeks ($P=.012$), 24 weeks ($P=.059$), and 52 weeks ($P=.008$) than patients treated with the rate-control strategy.³⁰ There were no significant differences in QOL between patients in sinus rhythm or AFib at the end of the study.³¹

Figure 2. SF-36 physical and mental summary scores for patients receiving rhythm- or rate-control therapy for AFib in AFFIRM.²⁹

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The Strategies of Treatment of Atrial Fibrillation (STAF) study randomized 200 patients with persistent AFib to rhythm or rate control and followed them for a mean of 19.6 months. Assessment of QOL with the SF-36 indicated improvement ($P<.05$) in 2 measures (physical role function and mental health) with the rhythm-control group and 5 measures (physical functioning, physical role function, bodily pain, social functioning, and mental health) for the rate-control group. There were no significant changes in AFib-related symptoms (dyspnea, palpitations, and dizziness) during the study period and no significant differences between the 2 groups for any measures.³²

Not surprisingly, given the findings summarized immediately above, results from meta-analyses that have evaluated the effects of different pharmacologic treatments on QOL in AFib patients have indicated no significant differences between the benefits of rhythm versus rate control. Results from combined analysis of results from 5 randomized clinical trials that included 5239 patients enrolled in AFFIRM, RACE, STAF, PIAF, and How to Treat Chronic Atrial Fibrillation (HOT CAFE) indicated no significant difference between treatment approaches in terms of QOL.³³ A separate analysis of the AFFIRM and PIAF trials carried out by the Cochrane Group supported the same conclusion.³⁴

Effects on Exercise Tolerance

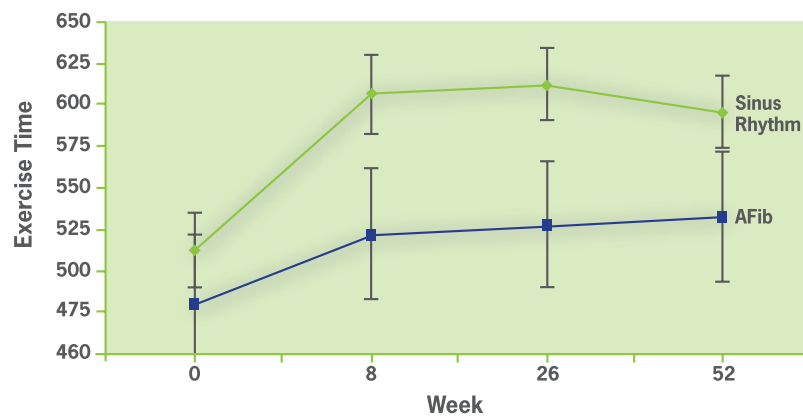
In contrast to the results for generic QOL, the achievement and maintenance of normal sinus rhythm is significantly superior to rate control in improving exercise capacity in patients with AFib.

Chung and colleagues assessed the effects of rate and rhythm control on patient functional status in a substudy of AFFIRM that included 245 participants who underwent 6-minute walk tests at initial, 2-month, and yearly visits. Results from this evaluation showed that 6-minute walk distance improved over time in both study arms, but that walk distance was 94 feet greater in the rhythm-control group than in the rate-control group (adjusted $P=.049$).³⁵

Exercise capacity in patients in normal sinus rhythm improved by 15% at 8 weeks in the SAFE-T study, and this improvement was maintained during the 1-year course of the study (Figure 3).³⁶

Figure 3. Exercise test time at baseline and 8, 26, and 52 weeks after cardioversion to sinus rhythm in the patients who completed all evaluations and remained in sinus rhythm ($n=129$) and those who reverted to AFib ($n=42$) in SAFE-T ($P=.06$).³⁶

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Results from a small-scale study of 154 patients with AFib assigned to either rate or rhythm control also indicated that improvement in exercise capacity was significantly greater in the rhythm-control group than with rate control over 1 year of follow-up ($P < .0001$).³⁷ In the HOT CAFE study, rhythm control, but not rate control, significantly improved exercise tolerance as measured by maximal treadmill workload ($P < .001$).³⁸ Results from the PIAF study showed that rhythm control with amiodarone was significantly superior to diltiazem-based treatment in improving 6-minute walk distance ($P = .008$ at 52 weeks). In these same patients, there was no significant between-group difference in QOL.³⁰

Why Don't Effects of Rhythm Versus Rate Control on Exercise Tolerance Predict Effects on General QOL?

A variety of factors beyond improved exercise capacity may contribute to QOL in patients with AFib. While it is clear that symptoms of AFib may be relieved either by restoring normal sinus rhythm or by rate control, it is also well known that the medications used to achieve these goals may result in clinically important adverse effects. Administration of β -blockers or calcium channel antagonists may result in lightheadedness, and β -blockers may also produce fatigue. Although rhythm-control medications may restore sinus rhythm and thus improve exercise tolerance, they may cause adverse effects, which counterbalance the increased exercise capacity. Flecainide and propafenone may produce dizziness or other central nervous system symptoms.¹⁸ Propafenone may also have negative inotropic effects and requires careful patient selection and exclusion of those with left ventricular dysfunction or congestive heart failure.³⁹ Amiodarone has been associated with significant clinical toxicities that may involve the lungs, thyroid gland, liver, eyes, skin, and nerves. The frequency of most of these adverse effects is related to total amiodarone exposure.⁴⁰ Other side effects of amiodarone may include nausea, anorexia, and photosensitivity.⁴⁰ In addition to these adverse events, all of the agents used for rhythm or rate control may cause symptoms due to bradycardia.¹⁸ Meta-analyses of AFib trials have demonstrated that the pharmacotherapeutic regimens used to achieve rhythm control are generally less well tolerated than those employed for rate control. Results from a systematic review of large-scale clinical studies of rhythm versus rate control have indicated further that the former approach is associated with higher risk for hospitalization and drug-related adverse events.⁴¹ For many sedentary patients, improvements in maximum exercise capacity on a treadmill may not translate into improved well-being or general life quality.

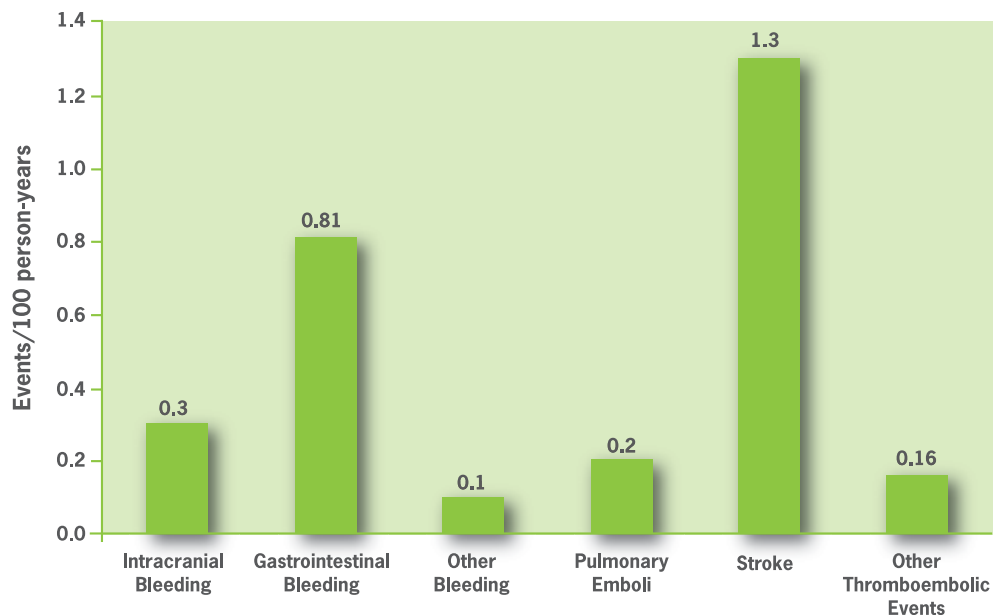
Anticoagulation

Atrial fibrillation greatly increases the risk for thromboembolic events, particularly embolic stroke,⁴² and stroke is associated with a significant reduction in QOL.^{11, 12} However, warfarin, the anticoagulant used most often in patients with AFib, is difficult to administer and may result in clinically important bleeding events.^{42, 43} Adherence to oral anticoagulant therapy is often poor in patients with AFib. Walker and Bennett recently used insurance claims data to assess anticoagulant usage among patients with AFib for the period from 1999 through 2005. Only 45% of about 117,000 patients with AFib/atrial flutter received anticoagulation therapy with warfarin, while 48% had no claim for any anticoagulant or antiplatelet agent.⁴² The most common adverse clinical event among patients included in this study was stroke, followed by risk for hemorrhage (Figure 4). Subtherapeutic anticoagulation (international normalization ratio [INR] < 2) was associated with a doubling of stroke incidence versus an INR in the therapeutic range.⁴² Supratherapeutic anticoagulation was correlated with a doubling of the incidence of cerebral hemorrhage.⁴²

Anticoagulation therapy is not utilized optimally in many patients with AFib, potentially increasing the rate of adverse outcomes related to stroke or serious bleeding events.⁴² Given the poor compliance and high risks associated with warfarin, it is perhaps not surprising that long-term warfarin therapy has not been shown to improve either physical or mental QOL in patients with AFib.⁴⁴

Figure 4. Adverse events in AFib/atrial flutter patients prescribed anticoagulant therapy.⁴²

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IMPROVING EXERCISE CAPACITY, SYMPTOMS, AND QOL IN PATIENTS WITH AFIB: ABLATION

Surgical intervention is potentially curative for patients with AFib, and the Maze procedure provides high success rates in patients with and without structural heart disease. This procedure eliminates AFib in the near term by isolation of the posterior left atrium, including all 4 pulmonary veins, and multiple incisions made on the right and left atria.⁴⁵ Other surgical options for patients with AFib include atrioventricular node ablation and left atrium isolation (not commonly used) and the corridor procedure.⁴⁶

Surgical intervention with the original Maze procedure and subsequent modifications has been demonstrated to significantly decrease symptom severity and improve QOL in highly selected patients with paroxysmal and persistent AFib, who typically were highly symptomatic and had previously failed antiarrhythmic drugs. Results from a Swedish study of 48 patients with drug-refractory AFib who underwent the Maze procedure indicated that this treatment significantly improved QOL. Before Maze surgery, SF-36 scores were significantly lower for these patients than for the general Swedish population. After surgery, QOL was significantly improved at 6 months and at 1 year on all scales except for bodily pain, which was not significantly decreased prior to treatment.⁴⁷ However, the invasive Maze operation is rarely performed today.

Wazni and colleagues carried out a prospective randomized study aimed at determining whether pulmonary vein isolation (PVI) was a feasible alternative to pharmacotherapy as first-line treatment for patients with symptomatic AFib. Patients were randomized to receive either PVI using radiofrequency ablation (n=33) or antiarrhythmic drug treatment (n=37; initial treatments with flecainide, sotalolol, or propafenone) and followed for 1 year. At the end of the 1-year follow-up, 63% of 35 patients who received antiarrhythmic drugs had at least 1 recurrence of symptomatic

AFib versus 13% of 32 patients who underwent PVI ($P < .001$). At 6-month follow-up, the improvement in QOL of patients in the PVI group was significantly better than that of patients who received drug therapy (Table 2). It should be noted, however, that patients in both treatment groups experienced substantial improvements in QOL versus baseline for physical functioning, bodily pain, social functioning, and vitality, and both also experienced ≥ 10 -fold reductions in duration of individual AFib episodes. The hospitalization rate was significantly higher in patients who received drug therapy (54%) versus those with surgical intervention (9%) ($P < .001$).⁴⁸

Table 2. QOL* Outcomes for Patients Undergoing Drug or Surgical Treatment as First-Line Therapy for Symptomatic AFib.⁴⁸

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| | Mean (SD) | | | | Corrected Difference in Mean Change at 6 mo (95% CI) | P Value |
|------------------------|---------------------------------------|-----------|----------------------------------|-----------|--|---------|
| | Pulmonary Vein Isolation Group (n=32) | | Antiarrhythmic Drug Group (n=35) | | | |
| Short-Form 36 Subscale | Baseline | Follow-up | Baseline | Follow-up | | |
| General health | 57 (2) | 9 (1) | 57 (2) | 68 (2) | 11 (8 to 14) | <.001 |
| Physical functioning | 71 (3) | 97 (3) | 69 (2) | 75 (7.5) | 20 (13.2 to 24.2) | .001 |
| Role physical | 73 (5) | 71 (2) | 51 (5) | 53 (3) | 14.9 (9.9 to 19.9) | .047 |
| Bodily pain | 71 (3) | 97 (1) | 70 (3) | 90 (3) | 6 (1.5 to 9.5) | .004 |
| Mental health | 65 (4) | 65 (2) | 64 (2) | 68 (3) | -4 (-3.5 to -7.5) | .62 |
| Social functioning | 78 (3) | 93 (3) | 76 (3) | 82 (2) | 9 (7.5 to 11.5) | .004 |
| Role emotional | 70 (1) | 76 (1) | 70 (1) | 75 (1) | 1 (-4.0 to 4.3) | .90 |
| Vitality | 52 (4) | 65 (1) | 51 (1) | 60 (2) | 4 (1.7 to 5.7) | .21 |

*Quality of life was assessed using the Medical Outcomes Study 36-item Short-Form health survey (Short-Form 36) and was measured at enrollment and 6-month follow-up visit.

PATIENT SELECTION FOR DIFFERENT AFIB THERAPIES

Selection of therapy that is likely to improve subjective and symptomologic measures of QOL for patients with AFib is particularly important, since no treatment for this condition with the exception of anticoagulation has been demonstrated to significantly reduce mortality.^{18,49} Although results from the studies reviewed above indicate that many different interventions have the potential to improve QOL in patients with AFib, no single approach appears to be consistently superior to any other. This suggests that a particularly important goal of research related to the management of AFib should be identification of patients who are likely to benefit from a given treatment and provision of individualized care based on prognostic patient characteristics.⁵⁰

This evaluation and treatment selection should include close attention to risk for adverse events, which may be viewed by many patients as being worse than the disease.⁵⁰ Information that can be used to guide treatment selection is currently being developed. For example, cardioversion for AFib has been shown to be less effective in patients with AFib and diabetes versus those with AFib alone or AFib and hypertension, and this may be due to greater oxidative endothelial damage in patients with AFib and diabetes versus the other groups.^{51,52} It has also been shown that the presence of hypertension and hyperlipidemia is associated with increased risk for AFib recurrence in patients who have undergone PVI.⁵³ Patients would benefit greatly from development of markers that might identify those most likely to gain QOL improvements and experience minimal adverse effects with specific AFib therapies.

CONCLUSIONS

Atrial fibrillation presents with a wide range of symptoms that may have a substantial negative impact on QOL. Results from observational and interventional studies have shown that AFib can negatively affect all QOL domains (eg, social, physical, emotional, economic). It is important to consider subjective patient-perceived dimensions of the severity of any illness, including AFib, when weighing the benefits versus the risks of therapy.⁷ Successful conversion and maintenance of normal sinus rhythm can markedly improve exercise tolerance, symptom severity, and QOL in patients with AFib, but the benefits associated with achievement of normal sinus rhythm may be blunted by the adverse effects of the drugs or surgical intervention used to reach this goal. Patients with AFib would benefit greatly from development of markers that might identify those most likely to gain QOL improvements and experience minimal adverse effects with specific therapies for this condition.

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The logo for AF Stat features the letters 'AF' in blue, a heart icon with a white ECG line inside, and the word 'Stat' in green. Below the logo is the tagline 'A Call To Action For Atrial Fibrillation' in a smaller, dark blue font.

AF Stat™

A Call To Action For Atrial Fibrillation

About *AF Stat™: A Call to Action for Atrial Fibrillation* — *AF Stat* is a collaboration of healthcare leaders and organizations working to improve the health and well-being of people affected by atrial fibrillation. *AF Stat* is raising awareness of AFib as a complex, costly, progressive and often debilitating disease. It also is calling for and helping promote a change in attitudes and behaviors to enhance AFib understanding, diagnosis and management. *AF Stat* is sponsored by sanofi-aventis U.S. LLC. More information can be found at www.AFStat.com