



Antithrombotic therapy in atrial fibrillation: an assessment of compliance with guidelines

Anil Nair, Wayne Hazell, Timothy Sutton, Sandhya Pillai

Abstract

Aim To assess physician compliance (at South Auckland's Middlemore Hospital) with two international guidelines on the prevention of thromboembolic complications of atrial fibrillation (AF). The two guidelines are The American College of Cardiology/American Heart Association/European Society of Cardiology consensus group (ACC/AHA/ESC guidelines-2001)¹ and the American College of Chest Physicians guidelines (ACCP guidelines-2001).²

Method A retrospective review of patients who presented to the emergency department with AF between 1 December 2001 and 28 February 2002. Antithrombotic treatment was compared with that recommended by the above stated international guidelines. It was hypothesised that 20% variance from guideline recommended treatment was clinically significant. The incidence of stroke in the study group was followed over a 12-month period.

Results Eighty patients were included in the study. The proportion of patients managed in accordance with the ACC/AHA/ESC and ACCP guidelines was 47.5% (95% CI 36.2-59.0) and 31.2% (95% CI 21.3-42.6) respectively. This was significantly different from that hypothesised ($p < 0.0001$). Only 47.4% (95% CI 34.0-61.0) and 47.3% (95% CI 33.6-61.2) of eligible patients, according to ACC/AHA/ESC and ACCP guidelines respectively, received warfarin. This was also less than hypothesised; $p < 0.0001$. High-risk patients were less likely to be given warfarin if they were older ($p < 0.03$). Four patients had a stroke at follow-up. These patients were not on warfarin, although recommended by the guidelines.

Conclusion Warfarin is significantly underutilised in patients with AF at our institution.

Atrial fibrillation (AF) is the most common arrhythmia managed in the emergency department.³ The incidence increases with age.⁴ It has been shown to be an independent risk factor for stroke, accounting for 15% of all strokes.⁵ The significant long-term clinical morbidity and mortality caused by embolic strokes has been well-documented.⁶ This has resulted in the recommendation for commencement of prophylactic antithrombotic therapy for certain patients with AF.

The decision to commence antithrombotic therapy is based on a delicate balance between the risks of thromboembolism and haemorrhage.⁷ Warfarin has been shown to be more effective than aspirin in decreasing the risk of stroke. Meta-analysis has shown that stroke incidence reductions of 62% and 22% were seen with warfarin and aspirin respectively⁷.

The perceived risks and benefits of antithrombotic therapy in atrial fibrillation vary immensely between medical practitioners, leading to a lack of consensus in the

management of atrial fibrillation.^{9,10} To establish uniformity in the treatment of atrial fibrillation a number of guidelines have been published.^{1,2}

This study was initiated with a view to assessing the need for construction and implementation of an AF clinical pathway at South Auckland's Middlemore Hospital. To aid this process, descriptive data was also collected on patient characteristics, outcome, and physician management.

Method

Study design—A retrospective descriptive study was performed on patients who presented to Middlemore Hospital's Emergency Department with AF between 1 December 2001 and 28 February 2002. The study was approved by the hospital as a quality audit.

Data collection—Eligible patients were identified using PIMS[®] (Patient Information Management System). All presentations to Middlemore Hospital over the study period with the ICD-10AM diagnosis of AF and atrial flutter (n=465) were reviewed. We excluded patients with a secondary diagnosis of AF (n=336). Other exclusions were atrial flutter (n=11) and those who presented for elective cardioversion (n=30). To prevent data duplication, only the first (n=7) of dual presentations were included. Data on one patient was unable to be obtained despite multiple attempts to locate the chart. Detailed review was conducted on the remaining patients (n=80).

Data was collected by 2 abstractors using Gilbert's methodology.¹¹ To assess inter-rater reliability, 23 charts were reviewed by both abstractors independently. Important variables were defined. The information was entered directly into a data collection form and electronically transferred to a Microsoft[®] Excel 2002 spreadsheet.

Physician anticoagulation compliance—A chart review was performed to obtain data on antithrombotic treatment received prior to admission, during the hospital stay, and on discharge. Details of in-hospital management were obtained including documented evidence of risk stratification. Risk stratification was assumed if explicitly documented in the notes or if the patient was discharged on guideline recommended antithrombotic therapy. Contraindications to warfarin for the study were a past history of gastrointestinal bleeding, intracerebral bleed, overt bleeding, blood dyscrasia, haemorrhagic tendency, chronic liver disease, dementia, history of falls, and allergy to aspirin or warfarin. (These were similar to those used in other studies.¹²)

Formal risk stratification was done based on the available data in accordance with the ACC/AHA/ESC guidelines¹ (Figure 1) and ACCP guidelines². To elicit compliance, the recommended anticoagulation strategy for each patient (derived from this risk stratification) was compared with the actual management.

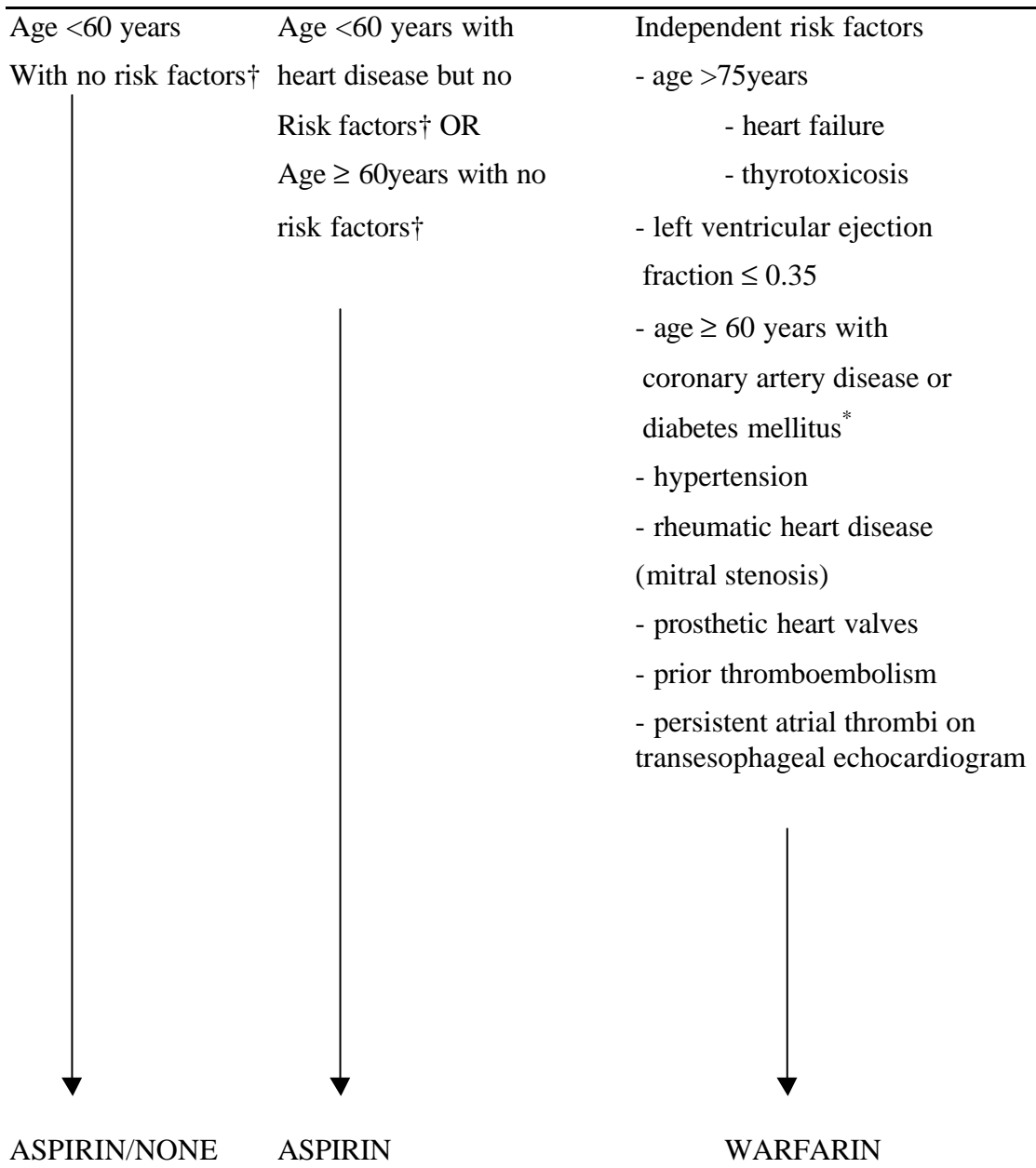
Descriptive data and patient follow up—The information collected included demographic data and length of stay from PIMS[®], radiology results from GEPACS[®] (digital radiology), and laboratory results from Éclair[®]. Charts were reviewed for data on antiarrhythmic treatment and echocardiograms reports. Data on antiarrhythmic treatment was also collected via retrospective chart review.

To identify subsequent stroke in the study group, clinical presentations (with stroke, transient ischaemic attack, or cerebral haemorrhage [ICD-10 AM diagnoses] over the period December 1, 2001 to February 28, 2003) were obtained using PIMS[®]. In addition, an event search was done to check for representations to any New Zealand hospital. The study group patients identified had their charts reviewed to assess the type of stroke, their antithrombotic treatment and their international normalised ratio (INR) at the time of event.

Statistics—As there were no hospital guidelines available for clinicians, it was felt unlikely that the gold standard [international guideline] compliance would be near 100%. The maximum clinically acceptable rate of inappropriate treatment was hypothesised to be 20%; taking into account the margin of error possible with a retrospective study. This hypothesised proportion was used in one-sample chi-squared tests to assess the deviation from guidelines.

The Mann Whitney U test was primarily used to compare the characteristics of high-risk patients who were treated versus those not treated with warfarin. Inter-rater reliability between data abstractors was measured using the kappa value. Statistical analysis was performed using SAS 8.0[®] (SAS Institute Inc., Cary, NC, USA).

Figure 1. ACC/AHA/ESC recommendations for antithrombotic therapy in patients with atrial fibrillation based on thromboembolic risk stratification.1



* The addition of aspirin is optional for these patients (Class IIB indications).

† Heart failure, left ventricular ejection fraction (LVEF) <0.35, history of hypertension.

Results

During the 12-week study period, 80 patient visits to the Emergency Department with AF were included in the study. The kappa score for inter-rater reliability for overall risk stratification was 0.9.

Results of descriptive data and patient follow up

Patient demographics, details of current presentation, and previous medical history are shown in Table 1, Table 2, and Table 3, respectively.

Table 1. Patient demographics

Demographics	N=80
Age	
Median age (years)	69
Age range (years)	27–93
Age <60 years	19 (24%)
Age 60–74 years	35 (44%)
Age ≥75 years	26 (32%)
Sex	
Males	40 (50%)
Females	40 (50%)
Ethnicity	
European	53 (66%)
Maori	8 (10%)
Pacific Islander	12 (15%)
Other	6 (8%)
Unknown	1 (1%)

Table 2. Details of current presentation (N=80)

Presenting symptoms (%)	
Shortness of breath	18 (23%)
Hypotension	1 (1%)
Chest pain	29 (36%)
Palpitations	50 (63%)
Other	21 (26%)
Asymptomatic	1 (1%)
Mean duration of current episode (hours/days)	n=80
<48 hours	55 (69%)
48 hours–7 days	12 (15%)
>7 days	8 (10%)
unknown duration	5 (6%)
Duration of atrial fibrillation	n=80
<1 year	44 (55%)
>1 year	32 (40%)
unknown	4 (5%)

Table 3. Details of past medical history (N=80)

Hypertension	38 (48%)
Diabetes mellitus	17 (20%)
Hypertension and diabetes mellitus	15 (18%)
Ischaemic heart disease	29 (36%)
Heart failure syndrome	15 (19%)
Valvular heart disease	12 (15%)
Left ventricular systolic dysfunction	8 (10%)
Cerebrovascular accident	8 (10%)
Transient ischaemic attacks	7 (9%)
Previous thromboembolism	1 (1%)
Hyperthyroidism	1 (1%)
Contraindications to warfarin administration	1 (1%)

The median length of stay was 1.5 days. Half the patients in our study were discharged in 1 day. Only one patient was discharged directly by the Emergency Medicine staff. The use of antiarrhythmic agents in hospital is shown in Table 4.

Table 4. Antiarrhythmic treatment

Antiarrhythmic agents	Pre-admission	In-hospital
Diltiazem	16%	38.8%
Amiodarone (oral)	5%	2.5%
Amiodarone (intravenous)	0%	37.5%
Sotalol	11%	10%
Metoprolol	4%	8.8%
Other beta blocker	13%	5%
Digoxin (oral)	5%	20%
Digoxin (intravenous)	0%	3.8%
Flecainide	8%	1.3%
None	39%	17.5%
More than one medication for rate control	9%	43.8%

Fifty patients achieved rhythm control (spontaneous cardioversion n=23; electrical cardioversion n=2; and suspected pharmacological cardioversion n=25) and the rest rate control (n=30). Seven of the patients who achieved rate control were referred for outpatient electrical cardioversion.

In the 12-month follow-up period, 4 patients in the study group presented to Middlemore Hospital with a stroke, 1 patient of whom died. According to the ACC/AHA/ESC guidelines, all these patients should have received warfarin but only one of them was discharged on warfarin. For the patient discharged home on warfarin, the general practitioner stopped warfarin therapy because of an episode of epistaxis (INR>4) and the patient subsequently presented to hospital with a stroke. Of those discharged home on warfarin, none had strokes in the 12-month follow-up period, and 1 patient had a subdural haemorrhage possibly contributed to by over-anticoagulation (INR 4.9).

There were no identified representations with a stroke to any other hospital in New Zealand.

Results of physician anticoagulation compliance

The use of antithrombotic agents on admission, during the hospital stay, and on discharge is shown in Table 5.

Table 5. Anticoagulant treatment (n=80)

Treatment	Pre-admission	In-hospital	Discharge
Aspirin alone	44	29	39
Warfarin alone	6	9	14
Enoxaparin alone	0	1	0
Combination therapy			
Warfarin and aspirin alone	5	14	17
Warfarin and enoxaparin alone	0	2	1
Warfarin + aspirin + enoxaparin	0	5	0
Warfarin + aspirin + enoxaparin+ subsequent heparin	0	1	0
Aspirin + dipyridamole	1	1	1
Enoxaparin + aspirin alone	0	13	0
No anticoagulation	24	5	8

Of the 11 patients taking warfarin on admission, 10 were on it for AF, and 1 for valvular heart disease. None of these patients had mechanical valves. Patients were started on antithrombotic treatment by general physicians and anticoagulation monitoring after discharge was by general practitioners. Tables 6 and 7 compare the antithrombotic therapy received by patients at discharge from Middlemore Hospital with the treatment recommended by the ACC/AHA/ESC and ACCP guidelines respectively.

The proportion of patients given antithrombotic treatment in accordance with the ACC/AHA/ESC and ACCP guidelines respectively was 47.5% [95% CI: 36.2–59.0]; and 31.2% [95% CI: 21.3–42.6] respectively. This was significantly different from that hypothesised ($p < 0.0001$).

Of the 62 patients who were initially eligible for warfarin therapy, as per ACC/AHA/ESC guidelines, 4 had clearly documented contraindications to the administration of warfarin (falls $n=2$, dementia $n=1$, erosive gastritis $n=1$). These patients were commenced on aspirin instead. One patient refused warfarin therapy.

Only 47.4% ($n=27$; 95% CI 34.0–61.0) of the remaining eligible patients ($n=57$) were discharged on warfarin. Similarly only 47.3% ($n=26$; 95% CI 33.6–61.2) of those eligible according to the ACCP guidelines ($n=55$) were discharged on warfarin. This also differed from the hypothesised proportion ($p < 0.0001$).

Table 6. Proportion of patients who received the ACC/AHA/ESC recommended treatment at discharge (n =80)

Treatment Received	Nil	Asp	Warf	Warf & Asp	CI	Correct Tx	Incorrect Tx	Total
Treatment Recommended								
ASPIRIN/NONE	6	1	1	2	0	7	3	10
ASPIRIN	1	5	1	1	0	5	3	8
WARFARIN	1	33	14	14	5	19	43	62

Nil=no treatment; Asp=aspirin; Warf=warfarin; CI=contraindications; Tx=treatment.

Table 7. Proportion of patients who received the sixth ACCP consensus recommended treatment at discharge

Treatment received	Nil	Asp	Warf	Warf & Asp	CI	Correct Tx	Incorrect Tx	Total
Treatment recommended								
LR = ASPIRIN	6	3	2	2	0	3	10	13
MR = ASP or WARF	1	4	1	1	0	5	2	7
HR = WARFARIN	1	33	12	14	5	17	43	60

Nil=no treatment; Asp=aspirin; Warf=warfarin; CI=contraindications; Tx=treatment.

ACCP guidelines: HR =High-risk group – prior stroke/TIA/systemic embolus, history of hypertension, poor left ventricular systolic function, age>75years, rheumatic mitral valve disease and prosthetic heart valve, patients with more than one moderate risk factor. Recommended therapy: warfarin.

MR =Moderate-risk group – age 65–75years, diabetes mellitus, coronary artery disease with preserved left ventricular systolic function. Recommended therapy: warfarin or aspirin.

LR =Low-risk group – age <65 years with no clinical or echocardiographical evidence of cardiovascular disease. Recommended therapy: aspirin.

Of those ACC/AHA/ESC guideline high-risk, warfarin-eligible patients, Table 8 compares the characteristics of patients who were discharged on warfarin with those who were not discharged on warfarin. The median ages were 72 years (range 36–84 years) and 77years (range 47–93 years) for recipients and non-recipients of warfarin respectively (Mann Whitney U, p=0.03).

Five and four patients, who were not recommended warfarin according to the ACC/AHA/ESC and ACCP guidelines, respectively, received warfarin.

Low molecular weight heparin (LMWH) was given in hospital for 22 patients. Of these patients, 12 had documented rationale for the commencement of LMWH: 5 patients had AF for >48 hours and 7 patients had unstable angina.

Table 8. Characteristics of those treated with warfarin versus those not treated with warfarin in high risk patients as per ACC/AHA/ESC guidelines

Variable	Given recommended warfarin therapy (n=27)	Not given recommended warfarin therapy (n=35)
Age median (range)	72 (36–84)	77 (36–84)
Age =75 years	6	20
Age 65-74 years	12	8
Age <65 years	9	7
Sex		
Male	13	16
Female	14	19
Risk factors		
Hypertension	18	20
Cerebrovascular accident	2	6
Transient ischaemic attack	2	5
Ischaemic heart disease	10	19
Diabetes mellitus	8	9
Left ventricular dysfunction	7	1
Total number of risk factors (including age)		
One risk factor	4	4
Two risk factors	12	18
Three risk factors	4	6
Four risk factors	5	4
Five risk factors	1	3
Six risk factors	1	0

Discussion

As far as we are aware, this study is the first New Zealand study to assess the management of AF since the ACC/AHA/ESC and ACCP guidelines were introduced in 2001.

AF is a powerful risk factor for stroke but this can be substantially reduced by the judicious use of antithrombotic agents.⁷ Recently the AFFIRM trial has demonstrated that rate control management for AF is not inferior to rhythm control management.⁹ Both management subtypes should be considered for anticoagulation.

Antithrombotic therapy does not follow the established guidelines at our institution with 47% and 31% differing from the ACC/AHA/ESC and ACCP guidelines respectively. Most patients had significant risk factors for stroke and would have substantially benefited from antithrombotic therapy. Despite this, only half the patients eligible for warfarin received this treatment. This suboptimal use has been seen in other international studies which show that only 15-44% of eligible patients receive warfarin.^{9,10,14–16}

High-risk patients were less likely to receive warfarin if they were older ($p < 0.03$). Other factors such as gender (chi-squared $p < 0.8$) and number of risk factors (Mann Whitney U, $p = 0.7$) seemed to play no significant role in that decision. The barriers to warfarin use in other studies include age, gender, concern regarding patient compliance, and physician assessment of risk versus benefit of therapy.^{14,15}

The Framingham Study showed that the proportion of strokes associated with this arrhythmia increase with age (36.2% for age 80–89 years).⁵ The intensity of anticoagulation is an important predictor of risk of bleeding in these patients.¹⁷ A multi-component strategy comprising patient education, self-monitoring of prothrombin time and guideline based warfarin dosing, has been found to reduce the risk of major bleeding (cumulative incidence 12% versus 5.6% in the normal versus intervention groups, respectively).¹⁸

The use of combination therapy (aspirin and warfarin) on discharge was in excess of both ACCP and ACC/AHA/ESC guidelines. The ACC/AHA/ESC guidelines only recommend the combination therapy of aspirin and warfarin together in those aged >65 years with either diabetes mellitus or ischaemic heart disease (Class IIB).¹ The ACCP guidelines do not recommend the use of this combination in any situation.² The SPAF III study showed that the use of adjusted dose warfarin was better in reducing the incidence of stroke than the combination of low-dose warfarin and aspirin (absolute risk reduction 6%).¹³

About 25% of patients in our study received LMWH. There are no clear recommendations in both guidelines on its use and more evidence is required before it can be routinely used in the management of AF.^{19,20} Heparin may be used in atrial fibrillation lasting less than 48 hours where a transesophageal echocardiogram guided inpatient cardioversion is to be attempted.¹

The risk of stroke for patients treated with warfarin at discharge was lower than that for patients who did not receive warfarin treatment, this is consistent with larger studies.⁷ The numbers pertaining to this complication in our study were far too small to make conclusions. We were also unable to ascertain current use of warfarin at follow-up.

Patients with AF are rarely discharged directly from the emergency department at our institution. Certain patients with AF can be successfully managed and discharged from the Emergency Department with substantial cost savings.^{21–23}

The study is limited by those limitations inherent in a retrospective study. It is possible that non-documented reasons existed for not giving warfarin to patients. The list of contraindications we used was not exhaustive, and did not include relative contraindications like alcoholism, use of anti-inflammatory drugs, uncontrolled hypertension and malignancy, which could have influenced the use of warfarin.

Other limitations include the exclusion of patients with a secondary diagnosis of AF. The follow-up period was relatively short, and could have potentially missed patients who did not present to New Zealand hospitals. We were also unable to assess how many of the patients on warfarin were compliant with therapy. The international guidelines^{1,2} used for the study had not been implemented at our institution at the time of the study.

In conclusion, there was a significant variance from established atrial fibrillation guidelines for antithrombotic therapy, and a significant underuse of warfarin in atrial fibrillation at our institution.

The practice points from our study are:

- Antithrombotic treatment, especially warfarin, should be considered in all patients presenting with atrial fibrillation and established thromboembolic risk factors.
- There needs to be increased clinician education, targeted at familiarity with international guidelines, to optimise utilisation of this effective therapy.
- Hospital or local guidelines should consider addressing the perceived clinician barriers to adhering to such guidelines.
- Multi-component strategies to address the intensity of anticoagulation reduce the risk of major bleeding.¹⁸

The New Zealand Guidelines Group (NZGG) has issued a draft document which will aid this process.²⁴ We plan to conduct a prospective post-implementation study to assess the effectiveness of this strategy.

Author information: Anil Nair, Registrar (Emergency Medicine); Wayne Hazell, Emergency Physician and Head of Emergency Medicine Education and Research; Timothy Sutton, Cardiologist; Sandhya Pillai, Registrar, Department of Emergency Medicine; Department of Medicine; Middlemore Hospital, Otahuhu, Auckland

Acknowledgments: We thank Elizabeth Robinson (Statistician Auckland University) for her help with the statistical analysis, and Dianne Wilson (Clinical Support Analyst, Middlemore Hospital) for her help with data retrieval from the patient information management system.

Correspondence: Anil Nair, Department of Emergency Medicine, Middlemore Hospital South Auckland, Fax: (09) 2709725; email: askumar@ihug.co.nz

References:

1. Ruster V, Rydén LE, Asinger RW, et al. ACC/AHA/ESC guidelines for the management of patients with AF: executive summary: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines and Policy Conferences (Committee to Develop Guidelines of the Management of Patients with Atrial Fibrillation). *J Am Coll Cardiol.* 2001;38:1231–65.
2. Albers GW, Dalen JE, Laupacis A, et al. Antithrombotic therapy in atrial fibrillation. *Chest.* 2001;119:194S–206S.
3. Huagui L, Easley A, Barrington W, Windle J. Evaluation and management of atrial fibrillation in the Emergency Department. *Emerg Med Clinics of North Am.* 1998;16:289–303.
4. Kannel WB, Abbott RD, Savage DD, McNamara PM. Epidemiological features of chronic atrial fibrillation: the Framingham Study. *N Engl J Med.* 1982;306:1018–22.
5. Wolf PA, Abbott RD, Kannel WB. Atrial fibrillation: a major contributor to stroke in the elderly: the Framingham study. *Arch Intern Med.* 1987;147:1561–4.
6. Benjamin EJ, Wolf PA, D'Agostino RB, et al. Impact of atrial fibrillation on risk of death: the Framingham Study. *Circulation.* 1998;98:946–52.
7. Hart RG, Benavente O, McBride R, Pearce LA. Antithrombotic therapy to prevent stroke in patients with atrial fibrillation: a meta-analysis. *Ann Intern Med.* 1999;131:492–501.
8. AFFIRM Investigators. A comparison of rate control and rhythm control in patients with atrial fibrillation. *N Engl J Med.* 2002;347:1825–33.
9. Chang HJ, Bell JR, Deroo DB, et al. Physician variation in anticoagulating patients with atrial fibrillation. *Arch Intern Med.* 1990;150:81–4.

10. Stafford RS, Singer DE. National patterns of warfarin use in atrial fibrillation. *Arch Intern Med.* 1996;156:2537–41.
11. Gilbert EH, Lowenstein SR, Koziol-McLain J, et al. Chart reviews in emergency medicine research: Where are the methods? *Ann Emerg Med.* 1996;27:305–8.
12. S.L.Jackson, G.M.Peterson, J.H.Vial, et al. Outcomes in management of atrial fibrillation: Clinical trial results can apply in clinical practice. *Intern Med J.* 2001;31:329–36.
13. Atrial fibrillation investigators. Adjusted dose warfarin versus low intensity fixed dose warfarin plus aspirin for high risk patients with atrial fibrillation. Stroke prevention in atrial fibrillation III randomised clinical trial. *Lancet.*1996;348:633–8.
14. Bungard TJ, Chali WA, Teo KK, et al. Why do patients with atrial fibrillation not receive warfarin? *Arch Intern Med.* 2000;160:41–6.
15. Man-Son-Hing M, Laupacis A, O'Connor A, et al. Warfarin for atrial fibrillation: the patient's perspective. *Arch Intern Med.* 1996;156:1841–8.
16. Frykman V, Beerman B, Rydén L, Rosenqvist M. Management of atrial fibrillation: discrepancy between guideline recommendations and actual practice exposes patients to risk for complication. *Eur Heart J.* 2001;22:1954–9.
17. Stephan D, Fihn, Catherine M, Callahan, Donald C, Martin et al. The risk for and severity of bleeding complications in elderly patients treated with warfarin. *Ann Intern Med.* 1996;124:970–9.
18. Beyth RJ, Quinn L, Landefeld CS. A multicomponent intervention to prevent major bleeding complications in older patients receiving warfarin. *Ann Intern Med.* 2000;133:687–95.
19. Weigner NJ, Caulfield TA, Danias PG, et al. Risk for clinical thromboembolism associated with conversion to sinus rhythm in patients with atrial fibrillation lasting less than 48hours. *Ann Intern Med.* 1997;126:615–20.
20. Kim M, Decena BF, Bruckman D, Eagle KA. Use patterns of low-molecular weight heparin and the impact on length of stay in patients hospitalised for atrial fibrillation. *Am Heart J.* 2003;145:665–9.
21. Kim MH, Morady F, Conlon B, et al. A prospective, randomised, controlled trial of an Emergency Department based atrial fibrillation treatment strategy with low-molecular-weight-heparin. *Ann Emerg Med.* 2002;40:187–92.
22. Koenig BO, Ross MA, Jackson RE. An Emergency Department observation unit protocol for acute-onset atrial fibrillation is feasible. *Ann Emerg Med.* 2002;39:374–81.
23. Michael JA, Stiell IG, Agarwal S, Mandavia DP. Cardioversion of paroxysmal atrial fibrillation in the Emergency Department. *Ann Emerg Med.* 1999;33:379–87.
24. The management of people with atrial fibrillation and flutter: New Zealand guidelines group consultation draft [New Zealand Guidelines Group website]. June 2004. Available online. URL: http://www.nzgg.org.nz/guidelines/dsp_guideline_popup.cfm?&guidelineID=85 Accessed January 2005.