

# Use of Anticoagulants in Elderly Patients with Atrial Fibrillation in Middlemore Hospital, Auckland

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## Abstract

**Purpose of Audit:** Atrial Fibrillation (AF) is common in elderly and is an independent risk factor for stroke. Numerous trials have shown that anticoagulation reduces this risk in patients with AF. Although studies have looked into the use of anticoagulation in elderly patients, there is paucity of information on its use in the elderly in New Zealand. This audit aims to examine use of warfarin in those above 65 years with AF in Middlemore Hospital, Auckland to stratify patients according to their baseline risk of stroke and assess reasons for withholding anticoagulation.

**Material & Methods:** Retrospective audit (from 01.01.03 to 31.03.03) of discharge summaries and medical notes of all patients, 65 years and above admitted to Middlemore Hospital with AF as either primary/or secondary diagnosis. We looked at demographic characteristics, whether AF was newly diagnosed or chronic, association with stroke related risk factors and whether anticoagulated and reason(s) if not.

**Results:** Of 370 patients admitted with AF, 71% had chronic AF and 29% had newly diagnosed AF. 87% had more than one risk factor for stroke. 25% of these patients underwent echocardiography. Of those who had previous stroke/TIA, 37% were on anticoagulation. Reasons for not anticoagulating were documented in 78% of patients.

**Conclusion:** Anticoagulation was under prescribed in high stroke risk patients with AF. The audit seeks improved efforts to stratify patients according to their baseline risk of stroke and implement evidence based guidelines on the use of anticoagulation in elderly with AF.

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## Introduction

Atrial fibrillation is the most frequent disturbance of cardiac rhythm after multiple ectopic beats in the elderly.<sup>1</sup> Present in only 0.5% of 50-59 year old subjects, the lifetime prevalence of atrial fibrillation is nearly 12% amongst people over 75 years of age.<sup>2</sup> Most cases of atrial fibrillation in older subjects are of non rheumatic aetiology.<sup>3</sup> It is now well established that atrial fibrillation is the most common cause of cardioembolic stroke and is directly responsible for more than one third of all strokes in persons 80-89

years of age.<sup>4</sup> Stroke in patients with atrial fibrillation is also more severe and the outcome markedly poorer than in patients with sinus rhythm.<sup>5</sup> In addition to clinical strokes, atrial fibrillation has been associated with an increased incidence of subclinical 'silent' strokes.<sup>6</sup> With increasing elderly population, atrial fibrillation will become a burden to the health care system. Over the past decade several randomised control trials have convincingly demonstrated the effectiveness of anticoagulation therapy both for primary and secondary prevention of stroke in subjects with atrial fibrillation.<sup>7,8</sup> The use of anticoagulation for stroke prevention is part of standard recommendations for management of patients with atrial fibrillation.<sup>9-11</sup> International reports suggest, however that evidence-based recommendations for use of anticoagulation in atrial fibrillation has not been mirrored by an increased use of warfarin in this clinical setting.<sup>12-14</sup>

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The aim of this retrospective audit was to determine the use of anticoagulation in elderly patients with atrial fibrillation in Middlemore Hospital, a tertiary hospital in Auckland, New Zealand.

**Methods**

Data was retrospectively collected from the medical records of all consecutive patients 65 years of age and above with atrial fibrillation as either primary or secondary diagnosis in Middlemore Hospital in the period from 01.01.2003 to 31.03.2003. When patients with atrial fibrillation were admitted more than once during this period, only the first admission was reviewed. A purpose designed data collection form was used to collect the following:

- a) Demographic data – age, sex, ethnicity, discharge destination;
- b) Admitting speciality;
- c) Length of stay;
- d) Whether atrial fibrillation was newly-diagnosed or chronic;
- e) Presence of coexisting risk factors for stroke: Previous stroke/TIA, hypertension, ischaemic heart disease, diabetes mellitus, heart failure, rheumatic mitral stenosis, prosthetic heart valve, thyrotoxicosis;
- f) Echocardiography – if done, left atrial size and left ventricular function;
- g) If patient was on anticoagulation prior to admission;
- h) Whether discharged on anticoagulation;
- i) If not, reason(s) for deferring anticoagulation.

Computerised analysis of the data was performed using SAS/STAT statistical software.<sup>15</sup>

The Chi-square ( $X^2$ ) test for comparative variables was examined. For multivariate analyses, logistic regression identified which factors predicted anticoagulant use and a significance level of  $p < 0.05$  was chosen for all analyses.

**Results**

Of the 3435 patients 65 years and above admitted to Middlemore Hospital from 01.01.2003 to 31.03.2003, 370 had a diagnosis of atrial fibrillation (10.8%). Of these patients 264 (71%) had chronic atrial fibrillation and 106 (29%) had newly diagnosed atrial fibrillation (Figure 1). There were 173 females (47%) and 197 males (53%). Mean age of the population was 79 years and mean length of stay was 8.08 days. Average length of stay for patients with chronic atrial fibrillation was 8.5 days and for those with newly diagnosed atrial fibrillation was 7.28 days. 92 patients (25%) had echocardiography (all of them transthoracic echocardiogram). 104 patients were on anticoagulation on admission and 128 patients were discharged on anticoagulation. Of these, 110 patients had chronic

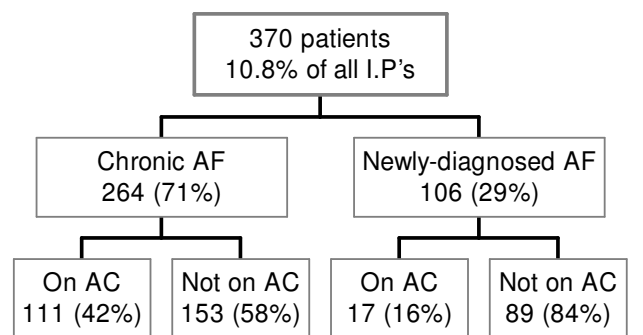


Figure 1: Distribution of patients AC- Anti Coagulation

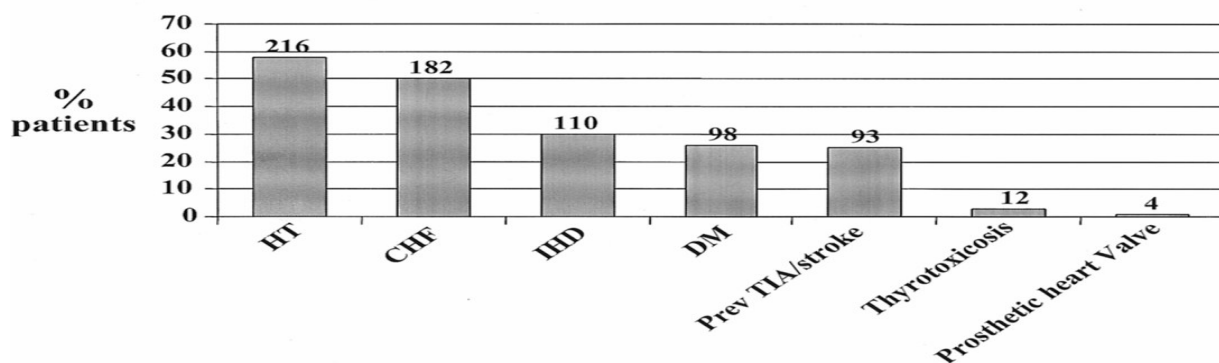


Figure 2: Presence of co-existing risk factors for stroke/TIA (n=370)

**Table 1: Likelihood of AC by Variables**

Variable	n	Percent on warfarin (95% CI)
Male	173	36.4 (+/- 7.3)
Female	197	33 (+/- 6.7)
65-74	132	47.7 (+/- 8.7)
75-80	80	36.3 (+/- 10.7)
81-85	86	24.4 (+/- 9.3)
86+	72	20.8 (+/- 9.6)
Discharge to home	302	38.7 (+/- 5.6)
Discharge to rest home	49	16.3 (+/- 10.6)
Discharge to private hospital	19	15.8 (+/- 16.7)
Chronic AF	264	41.7 (+/- 6.1)
New AF	106	17 (+/- 7.3)
Hypertension	216	38 (+/- 6.6)
IHD	110	32.7 (+/- 8.9)
CHF	182	40.1 (+/- 7.3)
Diabetes mellitus	98	38.8 (+/- 9.8)
Previous stroke / TIA	93	36.6 (+/-10)
Thyrotoxicosis	12	41.7 (+/- 28.5)
Prosthetic heart valve	4	100 (+/- 0)
Left atrial enlargement	50	62 (+/- 13.7)
LV dysfunction	17	48.1 (+/- 19.2)
No comorbidities	47	29.8 (+/- 13.3)

**Table 2: Use of anticoagulants by various specialities**

Speciality	On Admission	On Discharge
General Medicine	66	95
General Surgery	16	13
Cardiology	2	4
Orthopaedics	12	6
AT & R	3	5
Plastic Surgery	3	3
Gastroenterology	1	1
E.D	1	1

**Table 3: Likelihood of being on AC at admission**

Variable	Odds Ratio	95% Confidence Interval
Ethnicity: Asian	0.453	0.168-1.217
Maori	0.382	0.154-0.946
PI	0.262	0.111-0.623
Age: 75-84	0.473	0.266-0.841
85+	0.293	0.150-0.570
65-74		
AF: Old	5.734	2.849-11.54

**Table 4: Likelihood of receiving AC on Discharge (excluding patients already on AC)**

Variable	Odds Ratio	95% Confidence Interval
Echo	2.806	1.199-6.566
LOS: 4-7 days	0.749	0.302-1.855
8+ days	0.178	0.054 – 0.589
1-3 days		
Age: 75-84	0.415	0.172-1.002
85+	0.199	0.052 – 0.75
65-74		
AF	2.586	1.025-6.528

atrial fibrillation and 18 had newly diagnosed atrial fibrillation. Amongst patients not on anticoagulation, no reasonable explanation was documented in 97(40%) of the patients' notes. Of the 23 patients who died, 4 were on anticoagulation (but their death was not due to anticoagulation).

#### Use of Warfarin:

a) By patient age: patients were divided into 4 age groups –65-74, 75-80, 81-85, 86 and above. Mean age of patients on anticoagulation was 74.38 years and of those not on anticoagulation was 79.64 years.

b) Length of stay: mean length of stay for patients on anticoagulation was 4.41 days and for those not on anticoagulation was 8.59 days.

c) By discharge destination: patients were divided into discharge to home, rest home/retirement village or private hospital and amongst these groups, warfarin was utilised in 39%, 16% and 16% respectively.

d) By admitting speciality: 11 different specialities treated 370 patients with atrial fibrillation. Although more patients were admitted in medicine, there was no statistical significance in the utilisation of warfarin among the various specialities. Physicians, in general, continued their patients on anticoagulation. Surgeons, particularly orthopaedic surgeons stopped anticoagulation and did not restart in their patients on discharge.

e) Onset of atrial fibrillation: 42% patients with chronic atrial fibrillation were on anticoagulation at discharge, while 17% of patients with newly-diagnosed atrial fibrillation were discharged on anticoagulation.

f) Anticoagulation on admission: 104 patients were

**Table 5: Assessment of bleeding risk in older persons with atrial fibrillation**

Condition	Contraindication regarding warfarin sodium use	Grade of recommendation*	Level of evidence†
Bleeding diathesis	Absolute	C	III
Thrombocytopenia ( $50 \times 10^3/\mu\text{L}$ )	Absolute	C	II-2
Untreated and poorly controlled hypertension consistently ( $>160/90\text{mm Hg}$ )	Absolute	B	II-2
Noncompliance with medication or INR monitoring	Absolute	B	II-2
Significant alcohol use ( $>60\text{mL/d}$ )	Relative	C	II-2
Conventional NSAID use (without cytoprotection)	Relative	B	II-3
Participation in activities predisposing to trauma	Relative	B	III
Predisposition to falling	No	B	II-3
Perceived inability to adequately control INR status because of age	No	A	II-2
Conventional NSAID use with misoprostol or proton pump inhibitor	No	A	II-3
Cyclooxygenase – 2 inhibitor-specific / NSAID use	No	A	II-3
Recent, resolved peptic ulcer disease bleeding [with <i>Helicobacter pylori</i> testing and treatment]	No	A	II-2
Previous stroke	No	A	I

(Abbreviations: INR, International Normalized Ratio; NSAID, Nonsteroidal anti inflammatory drug.

\*Grades of recommendations (adapted from Canadian Task Force on Preventive Healthcare) A- good evidence to support the recommendation; B- fair evidence to support the recommendation; and C- poor evidence, but recommendations may be made on other grounds.

†Quality of published evidence (adapted from Canadian Task Force on Preventive Healthcare): I, evidence from at least 1 properly randomised controlled trial; II-1, evidence from well designed controlled trials with randomisation; II-2, evidence from well designed cohort or case-control analytic studies, preferably from more than 1 centre or research group; II-3, evidence from comparisons between times or places with or without the intervention (dramatic results in uncontrolled experiments could also be included here); and III, opinions of respected authorities, based on clinical experience, descriptive studies, or reports of expert committees.

on anticoagulation at the time of admission. Of these, 9 were not on anticoagulation at the time of discharge.

g) Stroke risk factors: hypertension was the most frequently documented additional stroke risk factor (58%), followed by congestive heart failure (49%), ischaemic heart disease (30%), diabetes mellitus (26%), previous stroke/TIA (25%), left atrial enlargement (13.5%), and left ventricular dysfunction (7%). 10

patients (3%) had greater than 5 stroke risk factors. Sixty percent of those with 5 or greater risk factors were on anticoagulation. Forty seven patients (13%) had no co existing risk factors for stroke/TIA (Figure 2).

h) Contra indication: overall, 242 (65%) patients were not on anticoagulation. Appropriate contra-indications were documented in 135 (60%) of the

**Table 6: Assessment of Stroke Risk In Older Persons with Atrial Fibrillation**

Additional Risk Factors	
Age > 65 yrs.	
History of Hypertension	
Left Ventricular Dysfunction	
Previous H/ o Transient Ischaemic Attack or Stroke	
Diabetes Mellitus	
Additional Risk Factors	Yearly Chance of Stroke%
2	10-12 (very high)
1	7-8 (high)
0	4-5 (medium)

patients' medical notes. No reasonable explanation was mentioned in 97 (40%) patients' medical notes.

Logistic Regression Analyses predicted those in the higher age groups were less likely to be on anticoagulation than those in younger age groups. Similarly, those with longer length of stay were less likely to be on anticoagulation, compared to those with shorter length of stay. Also, some evidence that those with chronic atrial fibrillation were more likely to be on anticoagulation compared with those with newly-diagnosed atrial fibrillation. It was noted that ethnic groups, such as Polynesians, Maori and Asians were less likely to be on anticoagulation on admission; however, this trend was not noted on discharge. The most significant factor determining whether a patient being discharged on anticoagulation was if they were

already on anticoagulation before admission.

## Discussion

Our audit has revealed the prevalence of atrial fibrillation in the elderly population of South Auckland to be 10.8%, which is quite similar to figures in the developed world.<sup>16,17</sup> Patients above 75 years of age were less likely to receive anticoagulants, similar to the practice in a similar age-group in Australasia.<sup>18</sup> Relatively more men with atrial fibrillation were on anticoagulation as compared to a previous study.<sup>19</sup> The mean age of the Middlemore population on anticoagulation was 74 years and it was quite similar with other studies.<sup>20</sup> There was no significant difference in the utilisation of anticoagulants amongst the medical or surgical specialities, unlike findings in earlier studies.<sup>21</sup> The presence of stroke risk factors did not reveal any significant association with the utilisation of anticoagulation unlike findings in earlier studies.<sup>23</sup> Although concerns remain of the risk of haemorrhage while on anticoagulation therapy in the elderly, there was no mention of active bleeding in any patient's notes in the audit.<sup>24, 25</sup> Overall, use of anticoagulation in the elderly was similar to those of Stewart et al, whose data were also extracted from the medical records of 171 patients, and were followed prospectively over a 12 week period.<sup>18</sup>

### *The limitations of our audit were:*

- a) Failure to note all the other medications our

**Table 7: Examples of potential contraindications to anticoagulation**

Definite Contradictions	Relative Contradictions
Active haemorrhagic lesions	Mild functional visual/hearing impairment
Active gastrointestinal ulceration	Mild cognitive impairment
Underlying coagulopathy/thrombocytopenia	Mild liver disease
History of major haemorrhage	Impaired gait/mobility without falls
Frequent injurious falls	Past history of gastrointestinal ulceration
Severe liver disease	Social isolation
Alcoholism	Significant drug interactions
Severe uncontrolled hypertension	
Severe cognitive impairment/dementia	
Active psychosis or confusional states	
History of non compliance	

patients were discharged on. This might have helped to identify those in whom anticoagulation was deferred due to its potential interaction with other drugs.

b) Lack of information on the precipitating cause(s) for the new onset of AF in our patients.

c) Failure to note if our patients had carotid duplex ultrasound, as it is well recognised that significant carotid artery stenosis is an important cause of non-cardioembolic strokes in the elderly.

d) The smoking status and lipid profile of our patients was not elucidated, although we recognise these are important risk factors for a stroke.

## Conclusion

The audit reveals sub optimal use of anticoagulation in the elderly with atrial fibrillation, similar to earlier study.<sup>26</sup> Stroke 'risk factors' are highly prevalent in the elderly patients with atrial fibrillation in whom the benefit of anticoagulation has been shown to outweigh the associated risk of adverse bleeding.<sup>27, 28</sup> The study calls for a comprehensive assessment of each patient with atrial fibrillation for anticoagulant therapy, based on risks, benefits and patient preferences rather than on the age itself. Also, echocardiography should be more widely used as recommended in both international and national guidelines for the management of atrial fibrillation patients. These efforts could lead to a reduction in the incidence of stroke which would benefit patients, clinicians and health services. With the increasing use of electronic discharge summaries for in-patients, it may be possible to calculate the stroke risk in older persons with atrial fibrillation, as well as their bleeding risk and incorporate them as a template which could be completed on admission (Table 5,6,7). This may help to decide whether a patient would benefit from anticoagulation.

## Future Directions

This is the first study in New Zealand to look into the use of anticoagulants in the elderly with atrial fibrillation. Future prospective studies can look into the patients' stroke 'risk factors', their medications and also enquire physicians reasons, if any, for not commencing patients on anticoagulation and see if there is a trend towards reduction of the burden of

disease, reduction of length of stay and reduction of mortality and morbidity.

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