



Q: Should nursing home residents with atrial fibrillation be anticoagulated?

AHMED ABDEL LATIF, MD

Department of General Internal Medicine,
The Cleveland Clinic

BARBARA J. MESSINGER-RAPPORT, MD, PhD

Section of Geriatric Medicine, Department of General Internal
Medicine, The Cleveland Clinic

A: Yes. Long-term care residents with atrial fibrillation and no absolute contraindications to oral anticoagulation are, as a group, undertreated. Most should benefit from anticoagulation.

■ EPIDEMIOLOGY

Nonvalvular atrial fibrillation, the most common arrhythmia in older people, was present in 6.2% of men and 4.8% of women who were 65 years old and over and living in the community at baseline in the Cardiovascular Health Study.¹ The prevalence of atrial fibrillation in long-term care residents is higher, 7.5% to 17%,²⁻⁴ reflecting the higher age and increased prevalence of cardiovascular disease in long-term care residents compared with adults in the community.

In the Framingham study,⁵ approximately 20% of ischemic strokes were attributed to cardioembolic events resulting from atrial fibrillation. Compared with other ischemic strokes, strokes associated with atrial fibrillation carried a mortality risk approximately twice as high and conferred more severe functional deficits in survivors.

■ ANTICOAGULATION REDUCES STROKES BUT INCREASES BLEEDING

A pooled analysis of five major trials in community-dwelling elderly patients with atrial fibrillation⁶ demonstrated that oral anticoagulation significantly reduces the risk of stroke.

Adjusted-dose warfarin therapy reduced the risk of stroke by 51% in adults older than 75 years without risk factors, and by 85% in those with one or more risk factors. Aspirin was less effective than warfarin but better than placebo.

Studies did not demonstrate a role for fixed-dose warfarin plus aspirin—this combination is less effective than adjusted-dose oral anticoagulation and causes more adverse effects.

A recent meta-analysis⁷ demonstrated that treating 1,000 patients who had atrial fibrillation for 1 year with warfarin vs aspirin prevented 23 ischemic strokes but caused 9 additional major bleeds, with survival benefit apparent 3 years after starting therapy. The number needed to treat varied from 17 in patients with prior cerebrovascular disease to 83 in those without.

After major study results were published in the 1990s, the rate of use of oral anticoagulation of older adults with atrial fibrillation in the community increased, from approximately 13% to 50%.⁸ Trends in oral anticoagulation in the long-term care setting have not been studied as much as in the community. Recent cross-sectional studies indicate warfarin is offered to 20% to 53% of long-term care residents with atrial fibrillation who do not have contraindications to it.²⁻⁴

Only about 40% of patients in nursing homes who receive warfarin achieve a therapeutic international normalized ratio (INR), however, compared with 50% in the community and 70% to 80% in anticoagulation trials.⁹

A clear understanding of stroke risk stratification may help balance the benefits of anticoagulation with the bleeding risks in nursing home residents.

Anticoagulation is underused in older patients with atrial fibrillation

**TABLE 1****Antithrombotic therapy for atrial fibrillation according to stroke risk**

STROKE RISK	CHRONIC OR PAROXYSMAL ATRIAL FIBRILLATION PLUS ONE OF THE FOLLOWING RISK FACTORS	GRADE*	LONG-TERM TREATMENT
High	Prior stroke, transient ischemic attack, or systemic embolus	1A	Warfarin, target INR 2.5 (range 2–3); if warfarin is contraindicated or declined, then aspirin 325 mg/day
	Hypertension	1A	
	Poor left ventricular systolic function	1A	
	Age > 75 years		
	Mitral valve disease ¹²		
	Rheumatic mitral regurgitation and/or stenosis	1C+	
	Mitral annular calcification	1C+	
	Mitral valve prolapse	1A	
	Nonrheumatic mitral regurgitation	1C+	
	Bioprosthetic or prosthetic heart valve ^{23†}	1C+	
Moderate[‡]	Age 65–75	1A	Warfarin, target INR 2.5 (range 2–3) or aspirin 325 mg/day
	Diabetes mellitus	1A	
	Coronary artery disease	1A	
	with normal left ventricular systolic function		
Low	Age < 65 and no cardiovascular disease	2C	Aspirin 325 mg/day

*Grade of the recommendations:

1A: clear evidence of benefit based on randomized controlled trials

1C+: clear evidence of benefit; no randomized controlled trials, but findings from observational studies and randomized trials in other populations can be extrapolated

2C: unclear evidence of benefit based on observational studies

†No randomized trials of oral anticoagulation have been undertaken in patients with mechanical prosthetic valves and atrial fibrillation, but oral anticoagulation is recommended; target INR for a prosthetic valve in sinus rhythm is either 2.5 (range 2–3) or 3.0 (range 2.5–3.5), depending upon the valve and the site. Low-dose aspirin (80–100 mg/day) may be added in certain situations (grade 1C+)

BASED ON ALBERS GW, DALEN JE, LAUPACIS A, ET AL. ANTITHROMBOTIC THERAPY IN ATRIAL FIBRILLATION. CHEST 2001; 119(SUPPL 1):1945–206S.

■ STROKE RISK STRATIFICATION

The yearly risk for stroke in community-dwelling people with atrial fibrillation is about 5%, varying from less than 1% in young people without risk factors to 17.6% in people with two or three risk factors.¹⁰ Long-term care residents with atrial fibrillation are older and have more cardiovascular disease than adults in the community. Thus they are more likely to fall into the moderate-risk or high-risk categories.

Guidelines derived from outpatient studies of atrial fibrillation in persons of all ages, published by the American College of Chest Physicians in 2001,^{11,12} can be used to divide persons with atrial fibrillation into three risk groups (TABLE 1). People who are 75 years old or older are classified as high-risk by this stratification.

Another risk-stratification scheme, called “CHADS₂,” may better reflect the frail elders seen in long-term care (TABLE 2).¹³ Validated in a cohort aged 65 to 95 years who were recently discharged from a hospital, this scheme may be particularly useful for people at low risk for whom anticoagulation and its attendant risk of bleeding may be deferred.

A similar scoring system based on the Framingham population was also published recently (TABLE 3).¹⁴

Naturally, any stratification scheme may underestimate stroke risk in certain people at high risk, such as those with recent transient ischemic attack, uncontrolled hypertension, cardiac thrombus, or mitral stenosis. The most useful strategy in deciding whether to initiate, continue, or withhold oral anticoagulation may be to complement the risk strat-

TABLE 2

CHADS₂ stroke risk classification scheme

Add 1 point for each of the following:

- Recent congestive heart failure
- Known hypertension
- Age 75 years or older
- Diabetes mellitus

Add 2 points for:

- A history of stroke or transient ischemic attack

SCORE	ADJUSTED STROKE RATE PER 100 PATIENT-YEARS
0	1.9
1	2.8
2	4.0
3	5.9
4	8.0
5	7.7
6	18.2

ADAPTED FROM GAGE BF, WATERMAN AD, SHANNON W, ET AL. VALIDATION OF CLINICAL CLASSIFICATION SCHEMES FOR PREDICTING STROKE: RESULTS FROM THE NATIONAL REGISTRY OF ATRIAL FIBRILLATION. JAMA 2001; 285:2864-2870.

Stroke risk without warfarin must be balanced against bleeding risk with it

ification scheme with relevant clinical information.

BLEEDING RISK WITH ANTICOAGULATION IN LONG-TERM CARE

Risks factors for major bleeding with warfarin are controversial. Most experts agree that the following are related to increased risk for major bleeding¹⁵:

- Intense therapy (INR > 3)
- Advanced age (> 75–80 years)
- Concomitant use of aspirin
- The first few weeks of oral anticoagulant therapy.

Leukoaraiosis seen on computed tomography was an independent risk factor for intracranial hemorrhage in the Stroke Prevention in Reversible Ischemia Trial (SPIRIT) (hazard ratio 7.5, 95% confidence interval 3.4–16),¹⁶ and may be common in persons with dementia and vascular risks often seen in the long-term care setting.

Other risk factors for bleeding such as hypertension, cerebrovascular disease, renal

disease, alcoholism, or liver disease have been identified in some studies but not all. Even the bleeding risks associated with falls in older adults may not outweigh the benefits of anticoagulation.¹⁷ The studies of oral anticoagulation are difficult to interpret because of methodological differences, including intensity of anticoagulant therapy in different studies.

Other potential risk factors for bleeding in older adults include increased sensitivity of older adults to warfarin, polypharmacy, probable underestimation of adverse drug events in the long-term care population, increased risk of injury from falls because of osteoporosis, and other associated comorbidities such as dementia.

One way of balancing the risk of bleeding for a long-term care resident is to determine if his or her risk is low, intermediate, or prohibitive (TABLE 4). Much of the nursing home population is expected to have at least an intermediate risk. Other options would be to use one of the recently validated schemes for predicting bleeding in patients on oral anticoagulation.^{18,19} Major predicting factors include age > 65 years, history of stroke, gastrointestinal bleeding, myocardial infarction, anemia, renal dysfunction, and diabetes mellitus.¹⁸ Since few adults over 80 years of age were included in the research cohorts, caution is necessary in applying these schemes to the long-term care setting.

One further factor to consider is the patient’s perception of risk. Patients perceive stroke as a more serious outcome than bleeding and may be more willing to take oral anticoagulation despite the risk of bleeding.²⁰

At this time there is no comparable alternative to warfarin to optimally reduce stroke risk while limiting bleeding risk in older adults with atrial fibrillation. Clinical studies of combined platelet inhibitors in vascular disease and acute coronary syndromes have been published,^{21,22} but not specifically in the setting of atrial fibrillation. Future studies would be helpful to address the benefit and risk of combined antiplatelet therapy or other therapy such as a direct thrombin inhibition with ximelaga-

**TABLE 3****How to calculate the risk of stroke (Framingham score)****1 Add the patient's total points**

	POINTS
Age (years)	
55–59	0
60–62	1
63–66	2
67–71	3
72–74	4
75–77	5
78–81	6
82–85	7
86–90	8
91–93	9
> 93	10
Sex	
Men	0
Women	6
Systolic blood pressure (mm Hg)	
< 120	0
120–139	1
140–159	2
160–179	3
> 179	4
Diabetes mellitus	
No	0
Yes	5
Prior stroke or transient ischemic attack	
No	0
Yes	6

2 Determine the patient's risk

PATIENT'S POINTS	5-YEAR RISK (%)
0–1	5
2–3	6
4	7
5	8
6–7	9
8	11
9	12
10	13
11	14
12	16
13	18
14	19
15	21
16	24
17	26
18	28
19	31
20	34
21	37
22	41
23	44
24	48
25	51
26	55
27	59
28	63
29	67
30	71
31	75

FROM WANG TJ, MASSARO JM, LEVY D, ET AL. A RISK SCORE FOR PREDICTING STROKE OR DEATH IN INDIVIDUALS WITH NEW-ONSET ATRIAL FIBRILLATION IN THE COMMUNITY: THE FRAMINGHAM HEART STUDY. JAMA. 2003; 290:1049–1056. AVAILABLE ONLINE AT <http://www.nhlbi.nih.gov/about/framingham/stroke.htm>.

Patient preference should be considered when deciding for or against anticoagulation

tran, or surgical intervention in this population to reduce the risk of stroke in atrial fibrillation.

SUMMARY

Most long-term care residents with atrial fibrillation would be at high risk for embolic stroke based on age and comorbidities according to the criteria presented here. Additionally, they are theoretically excellent candidates for adjusted-dose warfarin treatment for atrial fibrillation. They are accessible for monitoring and tend to have

less dietary variability, a controlled medication list, and supervised medication administration. Balancing these features is at least a moderate risk of severe bleeding from anticoagulation based on age, comorbidities, and polypharmacy.

However, studies suggest that even those long-term care residents identified as ideal candidates for anticoagulation may not receive warfarin.^{2–4} Those residents who do receive warfarin may not be anticoagulated within the therapeutic range much of the time. This treatment pattern may expose older adults with a high stroke risk to dying from a



TABLE 4

Stratification of bleeding risks of anticoagulation

RISK LEVEL	FEATURES
Prohibitive	Serious noncompliance Active bleeding Recent intracranial hemorrhage
Intermediate	No prohibitive risk factors Age > 80 Leukoaraiosis History of falls
Low	None of the above

cardioembolic stroke or to acquiring functional deficits that make them more dependent and lower their quality of life.

RECOMMENDATIONS

- Consider adjusted-dose warfarin for long-term care residents with atrial fibrillation as per the American College of Chest Physicians recommendations. The target INR is 2 to 3.
- The decision to start warfarin is based on the individual’s risks and potential benefits. The patient’s preferences and those of his or her family should be considered.
- The optimal intensity of anticoagulation is unknown for subgroups of patients with atrial fibrillation who have at least an intermediate risk of bleeding (eg, adults older than 75 or 80 years), but there is no evidence that an INR lower than 2 is efficacious. Some recommend an INR of 2 to 2.5 instead of 2 to 3. Another option is to use aspirin instead of warfarin for patients at high risk of bleeding.

REFERENCES

1. Furberg CD, Psaty BM, Manolio TA, et al. Prevalence of atrial fibrillation in elderly subjects (the Cardiovascular Health Study). *Am J Cardiol* 1994; 74:236–241.
2. McCormick D, Gurwitz JH, Goldberg RJ, et al. Prevalence and quality of warfarin use for patients with atrial fibrillation in the long-term care setting. *Arch Intern Med* 2001; 161:2458–2463.
3. Gurwitz JH, Monette J, Rochon PA, et al. Atrial fibrillation and stroke prevention with warfarin in the long-term care setting. *Arch Intern Med* 1997; 157:978–984.
4. Lackner TE, Battis GN. Use of warfarin for nonvalvular atrial fibrillation in nursing home patients. *Arch Fam Med* 1995; 4:1017–1026.
5. Lin HJ, Wolf PA, Kelly-Hayes M, et al. Stroke severity in atrial fibrillation. The Framingham Study. *Stroke* 1996; 27:1760–1764.
6. Atrial Fibrillation Investigators. Risk factors for stroke and efficacy of antithrombotic therapy in atrial fibrillation—analysis of pooled data from five randomized controlled trials. *Arch Intern Med* 1994; 154:1449–1457.
7. van Walraven C, Hart RG, Singer DE, et al. Oral anticoagulants vs aspirin in nonvalvular atrial fibrillation: an individual patient meta-analysis. *JAMA* 2002; 288:2441–2448.
8. Smith NL, Psaty BM, Furberg CD, et al. Temporal trends in the use of anticoagulants among older adults with atrial fibrillation. *Arch Intern Med* 1999; 159:1574–1578.
9. Gottlieb L, Salem-Schatz S. Anticoagulation in atrial fibrillation—does efficacy in clinical trials translate into effectiveness in practice? *Arch Intern Med* 1994; 154:1945–1953.
10. The Stroke Prevention in Atrial Fibrillation Investigators. Predictors of thromboembolism in atrial fibrillation: I. Clinical features of patients at risk. *Ann Intern Med* 1992; 116:1–5.
11. Albers GW, Dalen JE, Laupacis A, et al. Antithrombotic therapy in atrial fibrillation. *Chest* 2001; 119(suppl 1):1945–2065.
12. Salem DN, Daudelin HD, Levine HJ, et al. Antithrombotic therapy in valvular heart disease. *Chest* 2001; 119(suppl 1):2075–2195.
13. Gage BF, Waterman AD, Shannon W, et al. Validation of clinical classification schemes for predicting stroke: results from the National Registry of Atrial Fibrillation. *JAMA* 2001; 285:2864–2870.
14. Wang TJ, Massaro JM, Levy D, et al. A risk score for predicting stroke or death in individuals with new-onset atrial fibrillation in the community: the Framingham Heart Study. *JAMA* 2003; 290:1049–1056.
15. Levine MN, Raskob G, Landefeld S, et al. Hemorrhagic complications of anticoagulant treatment. *Chest* 2001; 119(suppl 1):1085–1215.
16. A randomized trial of anticoagulants versus aspirin after cerebral ischemia of presumed arterial origin. *Ann Neurol* 1997; 42:857–865.
17. Man-Son-Hing M, Nichol G, Lau A, et al. Choosing antithrombotic therapy for elderly patients with atrial fibrillation who are at risk for falls. *Arch Intern Med* 1999; 159:677–685.
18. Beyth RJ, Quinn LM, Landefeld CS. Prospective evaluation of an index for predicting the risk of major bleeding in outpatients treated with warfarin. *Am J Med* 1998; 105:91–99.
19. Kuijjer PM, Hutten BA, Prins MH, et al. Prediction of the risk of bleeding during anticoagulant treatment for venous thromboembolism. *Arch Intern Med* 1999; 159:457–460.
20. Devereaux PJ, Anderson DR, Gardner MJ, et al. Differences between perspectives of physicians and patients on anticoagulation in patients with atrial fibrillation: observational study. *BMJ* 2001; 323:1218–1222.
21. Yusuf S, Zhao F, Mehta SR, et al. Effects of clopidogrel in addition to aspirin in patients with acute coronary syndromes without ST-segment elevation. *N Engl J Med* 2001; 345:494–502.
22. Mehta SR, Yusuf S. The Clopidogrel in Unstable angina to prevent Recurrent Events (CURE) trial programme; rationale, design and baseline characteristics including a meta-analysis of the effects of thienopyridines in vascular disease. *Eur Heart J* 2000; 21:2033–2041.
23. Stein PD, Alpert JS, Bussey HI, et al. Antithrombotic therapy in patients with mechanical and biological prosthetic heart valves. *Chest* 2001; 119(suppl 1):2205–2275.

ADDRESS: Barbara J. Messinger-Rapport, MD, PhD, Department of General Internal Medicine, A91, The Cleveland Clinic Foundation, 9500 Euclid Avenue, Cleveland, OH 44195; e-mail rapport@ccf.org.