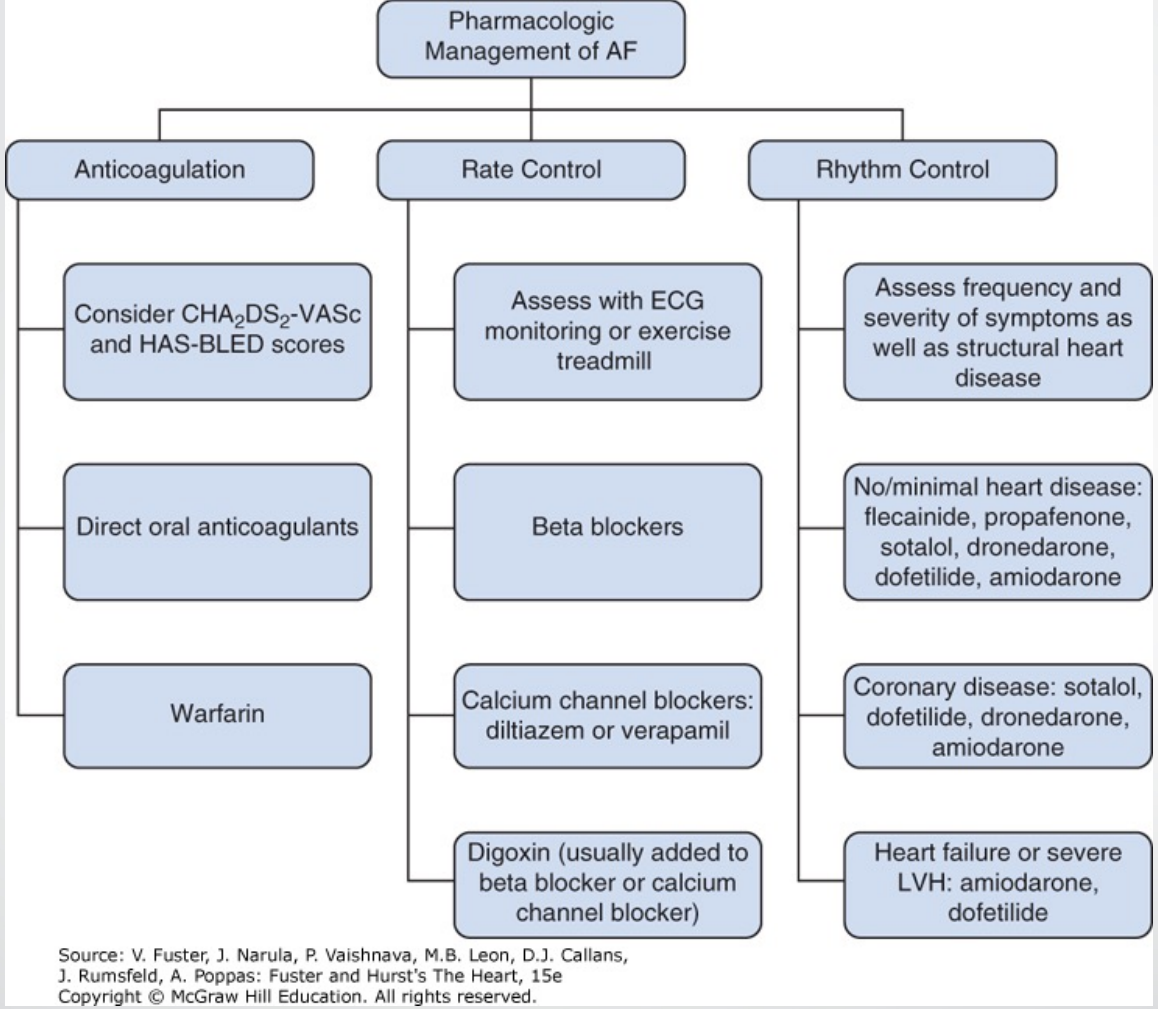


Source: V. Fuster, J. Narula, P. Vaishnava, M.B. Leon, D.J. Callans, J. Rumsfeld, A. Poppas: Fuster and Hurst's The Heart, 15e

Pharmacologic management of AF. The three pillars of management of AF are anticoagulation, rate control, and rhythm control. The decision on anticoagulation is based on the CHA_2DS_2-VASc and HAS-BLED scores. Direct oral anticoagulants are preferred over warfarin except in specific situations, such as the presence of a mechanical heart valve. Rate control is best accomplished with β-blockers or calcium channel blockers, with digoxin added in selected cases when rate control is not adequate. Rate control should be assessed with 24-hour ambulatory monitoring, and in some cases, exercise treadmill testing. The choice of an antiarrhythmic drug is based on the presence or absence of underlying heart disease. Flecainide and propafenone may only be used in patients without structural heart disease. Amiodarone is a second-line agent in patients with no or minimal heart disease, whereas it is a first-line agent in patients with HF and severe LV hypertrophy.

Citation: Chapter 36 Atrial Fibrillation and Atrial Flutter, Fuster V, Narula J, Vaishnava P, Leon MB, Callans DJ, Rumsfeld J, Poppas A. *Fuster and Hurst's The Heart, 15e;* 2022.
Available at: https://accessmedicine.mhmedical.com/content.aspx?bookid=3134&sectionid=265676221 Accessed: July 05, 2022

MANAGEMENT OF AF:
STROKE RISK STRATIFICATION

Clinical risk factors for stroke, transient ischemic attack, and systemic embolism in the CHA_2DS_2-VASc score

(A) The risk factor-based approach expressed as a point based scoring system, with the acronym CHA_2DS_2-VASc
(NOTE: maximum score is 9 since age may contribute 0, 1, or 2 points)

CHA_2DS_2-VASc risk factor	Points
Congestive heart failure Signs/symptoms of heart failure or objective evidence of reduced left-ventricular ejection fraction	+1
Hypertension Resting blood pressure >140/90 mmHg on at least two occasions or current antihypertensive treatment	+1
Age 75 years or older	+2
Diabetes mellitus Fasting glucose >125 mg/dL (7 mmol/L) or treatment with oral hypoglycaemic agent and/or insulin	+1
Previous stroke, transient ischaemic attack, or thromboembolism	+2
Vascular disease Previous myocardial infarction, peripheral artery disease, or aortic plaque	+1
Age 65-74 years	+1
Sex category (female)	+1

Clinical characteristics comprising the HAS-BLED bleeding risk score

Letter	Clinical characteristic*	Points
H	Hypertension (ie, uncontrolled blood pressure)	1
A	Abnormal renal and liver function (1 point each)	1 or 2
S	Stroke	1
B	Bleeding tendency or predisposition	1
L	Labile INRs (for patients taking warfarin)	1
E	Elderly (age greater than 65 years)	1
D	Drugs (concomitant aspirin or NSAIDs) or excess alcohol use (1 point each)	1 or 2
		Maximum 9 points

HAS-BLED score (total points)	Bleeds per 100 patient-years¶
0	1.13
1	1.02
2	1.88
3	3.74
4	8.70
5 to 9	Insufficient data

The HAS-BLED bleeding risk score has only been validated in patients with atrial fibrillation receiving warfarin. Refer to UpToDate topics on anticoagulation in patients with atrial fibrillation and on specific anticoagulants for further information and other bleeding risk scores and their performance relative to clinical judgment.

INR: international normalized ratio; NSAIDs: nonsteroidal antiinflammatory drugs.

* Hypertension is defined as systolic blood pressure >160 mmHg. Abnormal renal function is defined as the presence of chronic dialysis, renal transplantation, or serum creatinine ≥200 micromol/L. Abnormal liver function is defined as chronic hepatic disease (eg, cirrhosis) or biochemical evidence of significant hepatic derangement (eg, bilirubin more than 2 times the upper limit of normal, plus 1 or more of aspartate transaminase, alanine transaminase, and/or alkaline phosphatase more than 3 times the upper limit of normal). Bleeding predisposition includes chronic bleeding disorder or previous bleeding requiring hospitalization or transfusion. Labile INRs for a patient on warfarin include unstable INRs, excessively high INRs, or <60% time in therapeutic range.

¶ Based on initial validation cohort from Pisters R. A novel-user-friendly score (HAS-BLED) to assess 1-year risk of major bleeding in patients with atrial fibrillation: the Euro Heart Survey. Chest 2010; 138:1093. Actual rates of bleeding in contemporary cohorts may vary from these estimates.

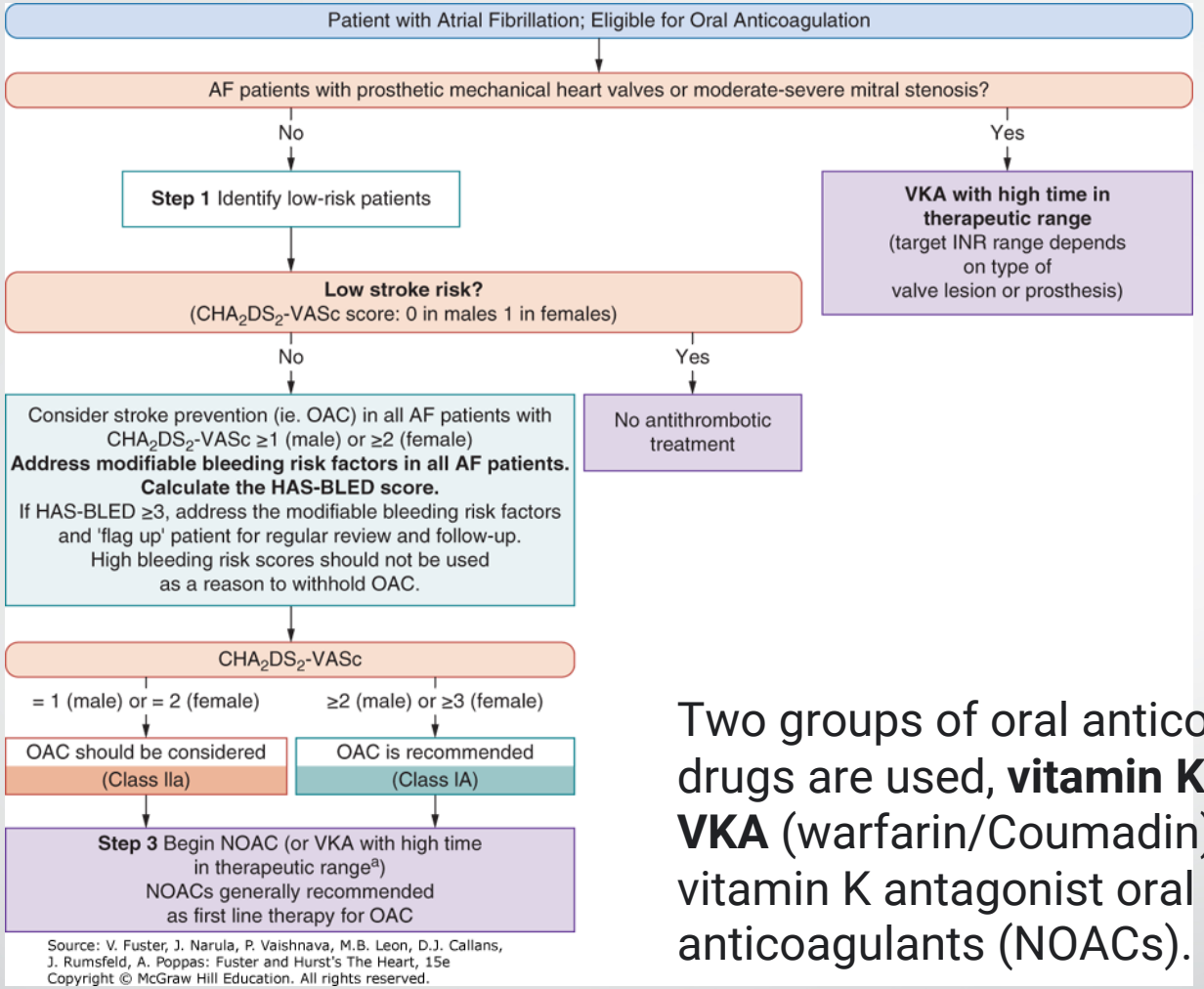
Original figure modified for this publication. Lip GY. Implications of the CHA2DS2-VASc and HAS-BLED Scores for thromboprophylaxis in atrial fibrillation. Am J Med 2011; 124:111. Table used with the permission of Elsevier Inc. All rights reserved.

UpToDate®

a score of 0 indicates low risk
1–2 indicates moderate risk
and ≥3 indicates high risk.

Please note: Decision to anticoagulate patient or not should not be based solely on the has-bled score
Your goal is to deal with modifiable risk factors and decrease the has-bled score
1- Control HTN
2- D/c NSAIDS or aspirin
3- ETOH management
4- If on warfarin. Tighter control with more frequent monitoring and diet management or switch them to a NOAC
5- preserve kidney and liver function: Pharm and non pharm approach.
Only two nonmodifiable risk factors are age, bleeding predisposition (ITP) or stroke.

Recommendations: Management with anticoagulants
Benefits outweigh the risk of bleeding in following group regardless of the has-bled score.
For a CHA_2DS_2-VASc score ≥2 in males or ≥3 in females
For a CHA_2DS_2-VASc score of 1 in males and 2 in females based on age 65 to 74 years,. Age 65 to 74 years is a stronger risk factor than the other factors conferring one CHA_2DS_2-VASc score point



Two groups of oral anticoagulant drugs are used, **vitamin K antagonists VKA** (warfarin/Coumadin) and non–vitamin K antagonist oral anticoagulants (NOACs).

Decision pathway for anticoagulation use in patients with AF. Key: AF, atrial fibrillation; CHA2DS2-VASc, Congestive heart failure, Hypertension, Age >_75 years, Diabetes mellitus, Stroke, Vascular disease, Age 65–74 years, Sex category (female); HAS-BLED, Hypertension, Abnormal renal/liver function, Stroke, Bleeding history or predisposition, Labile INR, Elderly (>65 years), Drugs/alcohol concomitantly; INR, international normalized ratio; NOAC, non–vitamin K antagonist oral anticoagulant; OAC, oral anticoagulant; SAMe-TT2R2, Sex (female), Age (<60 years), Medical history, Treatment (interacting drug(s)), Tobacco use, Race (non-Caucasian) (score); TTR, time in therapeutic range; VKA, vitamin K antagonist. If a VKA is being considered, calculate SAMe-TT2R2 score: if score 0–2, may consider VKA treatment (eg, warfarin) or NOAC; if score >2, should arrange regular review/frequent INR checks/counselling for VKA users to help good anticoagulation control, or reconsider the use of NOAC instead; TTR ideally >70

MANAGEMENT OF AF:
STROKE PROPHYLAXIS

- DOAC (direct-acting oral anticoagulant)/NOAC (novel oral anticoagulant) agents are preferred for most patients with nonvalvular atrial fibrillation who should receive anticoagulant therapy Dabigatran 150 mg q12h when creatinine clearance (CrCl) ≥ 50 mL/min (75 mg q12h when CrCl = 15–30 mL/min). No INR monitoring needed
  - Rivaroxaban (Xarelto) 20 mg/d when CrCl ≥50 mL/min (15 mg/d when CrCl = 15–50 mL/min)
  - Apixamab (Eliquis) 5 mg twice daily (2.5 mg twice daily when 2 or more of the following are present: age ≥80 years, weight ≤60 kg, or creatinine ≥1.5 mg/dL)
  - Edoxaban (savaysa) 60 mg po daily
- Warfarin
  - Patients with mechanical valves should be treated with **warfarin** to maintain an INR of 2.0 to 3.0 or 2.5 to 3.5 dependent on the type and location of the prosthesis.
  - titrated to maintain an INR of 2–3
    - Initial dose Coumadin 5 mg for adults, but start at 2.5 mg elderly patient older than 70 yo
    - Check INR q 2-3 days until therapeutic for two consecutive checks, then recheck in a week if therapeutic check once monthly.

Rhythm control versus rate control in atrial fibrillation

- Both strategies can fail both in the short and in the long terms.
- Most patient with new onset AFIB spontaneously convert within 72 hours after start of rate control medication.
- If they do not spontaneously convert. At least one attempt at cardioversion should be attempted.
  - Cardioversion is most often performed electrically but may also be achieved using antiarrhythmic drug therapy in some instances, **by experienced clinicians. (not in primary care)**
  - If duration of AFib/AFlut is ≥48 hours or unknown, anticoagulated for ≥3 weeks before cardioversion to reduce the risk of stroke.
  - Cardioversion attempted only after TEE is performed, continue anticoagulation 4 weeks post cardioversion.
  - Hemodynamically unstable: Hospitalization: Rhythm control is favored. Chemically or via cardioversion. See above.

Pharmacology intervention
Rate control in stable patients: Go Slow start low

- Optimal target for ventricular rate has not been firmly established, but there is evidence that aggressive control of the ventricular rate (<80 bpm) offers no benefit beyond more modest rate control (i.e., resting heart rate <110 bpm). So a range between range 80 to 100 is acceptable at rest

1- Beta blockers (e.g., metoprolol tartrate [Lopressor], atenolol [Tenormin])

- Example: metoprolol tartrate at 12.5–100 mg PO BID.
- Use in those with CAD and/or reduced systolic function.

2- Nondihydropyridine calcium channel blockers (e.g., verapamil [Calan, Verelan], diltiazem [Cardizem])

- Example: diltiazem (immediate release) 60–120 mg PO TID (max: 360 mg/day).
- Avoid use in those with reduced systolic function.
- Avoid combo therapy with a beta blocker increases bradycardia, syncope, and hemodynamic instability.

3- Digoxin (*least effective) for sedentary older adult only (80-year-old and above)*

- Example: digoxin 125 mcg PO daily.
- Can be taken with a beta blocker or calcium channel blocker.

4- Amiodorone: (considered mostly a rhythm control meds, but it does slow down ventricular rate)

- Due to short- and long-term effects: AHA/ACC strongly recommends to only as a second line therapy if other meds fail

A-FIB: Rhythms control

Restoration of sinus rhythm using electrical or pharmacologic cardioversion – Patient must be hemodynamically stable

- Electrical: Cardioversion
  - without anticoagulant therapy if Afib started less than or equal to 48 hours
  - If duration of AFib is >48 hours or unknown, anticoagulate for ≥3 weeks before cardioversion to reduce the risk of stroke.
    - Usually cardiologist will perform a TEE to r/o atrial thrombus
    - Continue anticoagulation for at least 4 weeks post successful cardioversion

The 2014 American College of Cardiology (ACC)/American Heart Association (AHA)/Heart Rhythm Society

A-FIB: Rhythm control strategies.

- **Involve a cardiologist:**
- Preferred for patients:
  - at high risk for a CV event
  - Fail rate control
  - AF diagnosed within one year who have not spontaneously converted
  - hemodynamically instable patients
  - Younger patient less than 6o yo or who are extremely active and need optimal cardiac performance.
- Restoration of sinus rhythms can be achieved with cardioversion: electrically or with antiarrhythmic drug therapy, ablation can also be performed as a last resort.
- Antiarrhythmic therapy for long-term maintenance of sinus rhythm:
  - Options for pharmacologic cardioversion include Flecainide, dofetilide, propafenone, ibutilide and amiodorone if LVH, HF, or CAD. **Amiodarone is effective and is commonly prescribed**.(and a horrible drug)
- There is currently no standard/optimal rhythm control drug therapy in older adults with symptomatic AF

ISSUES FOR REFERRAL

- Management of AFib refractory to standard medical therapy
  - unable to achieve adequate rate control with medication
  - development of significant bradycardia and hemodynamic instability with rate control
  - the use of more aggressive treatments.
    - These may include pacemaker implantation
    - to allow for more intensive pharmacologic blocking of the AV node
    - or an ablation procedure. AFlut in particular is often very amenable to ablation;
    - thus, consideration should be given to early expert referral in appropriate patients. Antiarrhythmic drug therapy can often be very effective but should be prescribed by experienced practitioners.