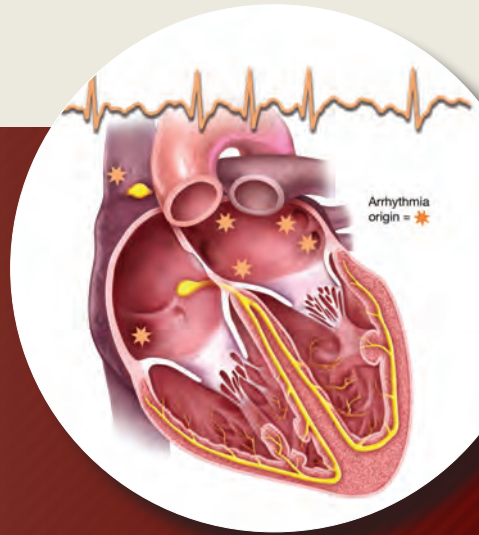


Pocket Guide

Managing the Patient with Atrial Fibrillation

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DEFINITION¹

- Uncoordinated atrial activation with consequent deterioration of atrial mechanical function.

CLASSIFICATION²

- Paroxysmal: Recurrent AF (≥ 2 episodes) that terminates spontaneously within 7 days. Episodes of AF of ≤ 48 hours' duration that are terminated with electrical or pharmacologic cardioversion should also be classified as paroxysmal AF.
- Persistent: AF that is sustained > 7 days. Episodes of AF which are terminated by electrical or pharmacologic cardioversion after ≥ 48 hours of AF, but prior to 7 days, should also be classified as persistent AF episodes.
- Longstanding persistent: Continuous AF of > 1 year duration.
- Permanent: AF for which decision has been made, by the patient and the physician treating the AF, not to pursue restoration of sinus rhythm by any means.

EPIDEMIOLOGY¹

- Most common arrhythmia in clinical practice.
- Prevalence: 0.4% to 1% in general population, increasing with age to 8% in those > 80 yrs.
- Mortality: $\sim 2x$ that of patients in normal sinus rhythm.
- Stroke rate: $\sim 5\%$ per year; higher in patients with valvular heart disease (5x increase in relative risk).

PATHOPHYSIOLOGY^{1,2}

- AF may be triggered by a focal source of rapid atrial electrical depolarization, often in the pulmonary veins. It is sustained by the presence of multiple reentrant wavelets.

RELATED CONDITIONS

- AF may be triggered by acute, temporary causes, including alcohol intake ("holiday heart syndrome"), surgery, electrocution, MI, pericarditis, myocarditis, pulmonary embolism, or hyperthyroidism. In these cases, concurrent treatment of the underlying disorder and management of AF with a short course of nodal blocker or antiarrhythmic medication usually results in termination of AF without recurrence.
- AF may also be triggered by other arrhythmias, such as atrial tachycardia or flutter, Wolff-Parkinson-White (WPW) syndrome, or AV nodal reentrant tachycardia. Treatment of the triggering arrhythmia may prevent future AF episodes.
- AF may also be associated with chronic disorders, such as CHF, sleep apnea, hypertension, and BMI over 30. Treatment of these related conditions may ameliorate or eliminate AF.

EVALUATION¹

The minimum evaluation of AF should include:

- History and physical examination to identify symptomatic and asymptomatic occurrences as well as frequency, duration, and precipitating factors and to rule out secondary causes of AF. Should also determine response to prior therapies (i.e., pharmacological agents or cardioversion).
- Electrocardiogram to verify AF, though long-term ambulatory monitoring often required for rhythm confirmation in patients with paroxysmal AF.³ Should also evaluate ECG for preexcitation (WPW), prior MI, or other atrial arrhythmias.

- Transthoracic echocardiogram, to identify valvular heart disease, LA and RA size, LV size and function.
- Blood tests of thyroid, renal, and hepatic function.

ACUTE TREATMENT

- **Hemodynamically unstable:**
 - Sedate if possible and perform an immediate cardioversion.
 - If refractory to cardioversion: IV amiodarone, ibutilide, or procainamide.
- **Hemodynamically stable:**
 - Anticoagulation and rate control.
 - If first occurrence, consider cardioversion after adequate anticoagulation (four weeks) or no clot seen on TEE while therapeutically anticoagulated.
 - If multiple occurrences, consider referral to electrophysiologist.
- **Consider admission if history suggests a precipitating event (e.g., acute MI, PE, CHF, etc.).**
 - Rule out secondary causes (listed above) based on history.
 - Perform evaluation as stated above.

GOALS OF LONG-TERM TREATMENT

- Anticoagulation to prevent stroke.
- Improvement in symptoms, functional capacity, and quality of life.
- Prevention of tachycardia-induced cardiomyopathy.

STROKE RISK AND PREVENTION⁴

- AF is an independent risk factor for stroke.
- Risk of stroke varies based on the presence of the CHADS₂ or CHA₂DS₂-VASc risk factors listed below. The risk of stroke is also increased significantly in patients with mitral stenosis or mechanical heart valves.
- Long-term anticoagulation with a systemic anticoagulant (warfarin or an Xa or direct thrombin inhibitor) is indicated in patients with a CHADS₂ or CHA₂DS₂-VASc score of ≥ 2 . The CHA₂DS₂-VASc risk score places greater weight on the presence of minor risk factors allowing further stratification of intermediate-risk patients.
- Warfarin alternatives (dosing must be adjusted for renal insufficiency)
 - Dabigatran, a direct thrombin inhibitor, was noninferior to warfarin for stroke prophylaxis in atrial fibrillation.⁵
 - Rivaroxaban, an oral factor Xa inhibitor, was noninferior to warfarin for the prevention of stroke or systemic embolism.⁶ If anticoagulation with rivaroxaban must be discontinued for a reason other than pathological bleeding, consideration must be given to administering another anticoagulant (FDA boxed warning).⁷
 - Apixaban, another oral Xa inhibitor (not yet FDA approved), appears superior to warfarin in preventing stroke or systemic embolism, and is associated with less bleeding and lower mortality.⁸
 - There are no clinically studied reversal agents for warfarin alternatives. Agents, such as prothrombin complex concentrate, activated prothrombin complex concentrate, or recombinant factor VIIa (rFVIIa), may be considered but have not been evaluated in clinical trials.

CHADS ₂ Risk Criteria	Points
Congestive heart failure	1
Hypertension	1
Age > 75 years	1
Diabetes mellitus	1
Prior stroke or TIA	2

Risk Category	Recommended Therapy
No risk factors	Aspirin, 81 to 325 mg daily or no therapy.* No therapy preferred. ⁹
1 point	Aspirin, 81 to 325 mg daily, or oral anticoagulant**
2 or more points	Oral anticoagulant**

CHA ₂ DS ₂ -VASc Risk Criteria ^{9,10}	Points
Congestive heart failure/LV dysfunction	1
Hypertension	1
Age > 75 years	2
Diabetes mellitus	1
Prior stroke, TIA, thromboembolism	2
Peripheral vascular disease or coronary artery disease	1
Age > 65 years	1
Sex category (i.e., female sex)	1

Risk Category	Recommended Therapy
No risk factors	Aspirin, 81 to 325 mg daily or no therapy.* No therapy preferred. ⁹
1 point	Aspirin, 81 to 325 mg daily, or oral anticoagulant**
2 or more points	Oral anticoagulant**

*Aspirin or no therapy is acceptable for patients < 60 years old and no heart disease (lone AF).

**If warfarin is the oral anticoagulant used, INR should be 2.0 to 3.0, with a target of 2.5. INR < 2.0 is not effective at preventing strokes. If patient has a mechanical valve, target INR > 2.5.

Adjusted Stroke Rates for CHADS₂ and CHA₂DS₂-VASc Risk

	Adjusted stroke rate (%/year) based on CHADS ₂ score ¹¹	Adjusted stroke rate (%/year) based on CHA ₂ DS ₂ -VASc score ¹²
0	1.9	0
1	2.8	1.3
2	4.0	2.2
3	5.9	3.2
4	8.5	4.0
5	12.5	6.7
6	18.2	9.8
7		9.6
8		6.7
9		15.2

LONG-TERM TREATMENT

Patient Presentation—Asymptomatic: Rate control alone typically recommended. Symptoms of AF may be subtle and include a sense of fatigue or decreased exercise tolerance. Older patients often attribute these to aging. Many practitioners attempt to restore sinus rhythm to reassess a patient's symptom status before abandoning a rhythm control strategy.

Patient Presentation—Symptomatic: Obtain rate control. If symptoms persist, refer to electrophysiologist or cardiologist for rhythm control with drugs or ablation.

Rate Control

Drugs:

Beta-blockers; Ca-channel blockers (verapamil or diltiazem); digoxin. (Digoxin is rarely an effective rate control agent as a single drug.)

If drugs fail, may consider ablation of AV node and pacemaker: Improves symptoms but not mortality.

HR control considered adequate if resting heart rates < 110bpm.¹³

Rhythm Control

Drugs:

Normal hearts: Any antiarrhythmic drug. Consider referral to electrophysiologist if the patient has impaired renal or hepatic function.

Structural heart disease or CAD: Sotalol, dofetilide, amiodarone, dronedarone. Amiodarone is not considered a first-line antiarrhythmic medication except in patients with heart failure or substantial hypertrophy.

CHF: Amiodarone, dofetilide.

Two-year success rate: Amiodarone ~60%; other drugs ~40%.

Catheter Ablation:

Is recommended for patients with symptomatic paroxysmal AF (PAF) who are refractory or intolerant to at least one Class 1 or 3 antiarrhythmic medication.²

Most success with PAF but can be used to treat AF of any duration (Class IIa indication for persistent AF, Class IIb indication for longstanding persistent AF).²

Success rate approximately 70-80% in PAF, lower in persistent AF.

Recurrences of AF (or AT) after index AF ablation procedures leads to repeat ablation in 20%-40% of patients.¹⁴

Concomitant Surgical Ablation:

Surgical ablation is reasonable for patients with paroxysmal, persistent, or longstanding persistent symptomatic AF who are undergoing surgery for other indications prior to initiation of a Class I or 3 antiarrhythmic medication (Class IIa indication) and may also be considered for longstanding persistent AF patients who have not yet failed antiarrhythmic therapy (Class IIb indication).²

Stand-Alone Surgical Ablation:

Stand-alone surgical ablation may be considered for patients with paroxysmal, persistent, or longstanding persistent symptomatic AF refractory or intolerant to at least one Class 1 or 3 antiarrhythmic who have failed catheter ablation or have not failed catheter ablation but prefer a surgical approach (Class IIb indication). Stand-alone surgical ablation is not recommended prior to initiation of antiarrhythmic drug therapy with a Class 1 or 3 antiarrhythmic agent.²

Rhythm control strategies do not obviate the need for anticoagulation. Decision for anticoagulation should be made based on the risks outlined above.

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Visit www.HRSonline.org/AF to learn more about the Society's Atrial Fibrillation Disease State Initiative and view resources for physicians and patients.

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