

## INTRODUCTION

In atrial fibrillation the electrical flow is chaotic causing the heartbeat to become irregular. Atrial fibrillation (AF) is the most common arrhythmia encountered in clinical practice and accounts for 1/3 of hospital admissions for cardiac rhythm disturbances.

## PREVELANCE OF AF IN ELDERLY

For both men and women, prevalence and incidence of AF were disproportionately higher in developed nations compared with developing nations. The reported annual incidence of AF in men and women in the age group of 55–64 years has been reported to be 0.003% and 0.001% respectively, which increases to 0.038 in men and 0.031 in women in the 85–94 age group. In general, the incidence of AF is 0.1% per year in the population below forty years and increases to 2% in those older than 80 years.

## PATHOPHYSIOLOGY OF AF (FIGURE 1)

Aging heart, characterized by myocardial fibrosis and atrial dilation, is a proper soil for AF to flourish. AF creates electrical and structural remodeling in the atria by shortening, mismatching, and lengthening the effective refractory period (increase of dispersion), depressing the intra-atrial conduction, and depriving its contractile function.

## SIGN AND SYMPTOMS

When heart goes into atrial fibrillation patient may experience dangerous and frightening symptoms. AF may cause symptoms such as:

- Dizziness

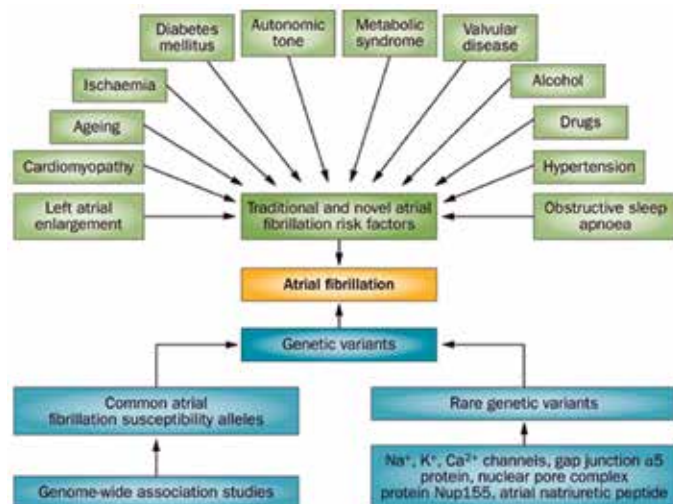
- Feeling of palpitations
- Shortness of breath
- Chest pain
- Fatigue or exercise intolerance

## MANAGEMENT AND TREATMENT

The goals in the treatment and management of AF are, first, to prevent thromboembolic episodes, mainly strokes,

**Table 1: Cardiovascular Morbidity and Mortality Associated with Atrial Fibrillation**

Event	Association with AF
Death	Increased mortality, especially cardiovascular mortality due to sudden death, heart failure or stroke
Stroke	20-30% of all strokes are due to AF. A growing number of patients with stroke are diagnosed with 'silent', paroxysmal AF.
Hospitalizations	10-40% of AF patients are hospitalized every year.
Quality of life	Quality of life is impaired in AF patients independent of other cardiovascular conditions
Left ventricular dysfunction and heart failure	Left ventricular dysfunction is found in 20-30% of all AF patients. AF causes or aggravates LV dysfunction in many AF patients, while other have completely preserved LV function despite long-standing AF
Cognitive decline and vascular dementia	Cognitive decline and vascular dementia can develop even in anticoagulated AF patients. Brain white matter lesions are more common in AF patients than in patients without AF.



**Fig. 1: Risk Factor for Atrial Fibrillation**

which leads to a considerable reduction in mortality, and second, to improve the quality of life, by reducing the symptoms and hospitalizations (Table 1). The first goal is achieved using anticoagulant therapy, and the second is achieved through rhythm or rate control. Newer techniques such as catheter ablation are rapidly establishing their role in treatment.

### Anticoagulation therapy in elderly patients

Elderly patients should be administered anticoagulation therapy for AF. Both CHADS<sub>2</sub> and the newer CHA<sub>2</sub>DS<sub>2</sub>-VASc scores emphasize the importance of increased age in the evaluation of thromboembolic risk (Table 2). Patients with CHADS<sub>2</sub>  $\geq$  2 should receive oral anticoagulation (OAC). Patients with score 1 are subject to the physician's opinion to receive anticoagulants or aspirin. Using the newer CHA<sub>2</sub>DS<sub>2</sub>-VASc score, all patients older than 75 years should receive OAC, unless there is a strong contraindication (Table 3).

The ATRIA1 and BAFTA17 studies have shown that elderly patients with AF benefited by the use of anticoagulation therapy. OACs have reduced the thromboembolic risk in these patients when compared to aspirin. The OACs used in these studies were vitamin K antagonists

(VKAs), especially warfarin. Maintaining an international normalized ratio (INR) between 2.0 and 3.0 is the target for thromboembolic protection. The revised guidelines by Japanese Circulation Society (JCS) suggest a target INR of 1.6–2.6 for patients with nonvalvular AF and aged  $\geq$  70.18.

INR should be monitored regularly, even if the patient is stable, and every one of them must keep an INR diary. Elderly patients are prone to injuries and falls, and thus the fear of bleeding is considerable in them. The HAS-BLED19 and HEMMORR2HAGES20 scores are valuable tools in evaluating these patients' bleeding risk (Table 4).

VKAs are connected to serum albumin. In the elderly patients, serum albumin levels often drop dramatically

**Table 3: Therapeutic Recommendations**

Risk category	CHA <sub>2</sub> DS <sub>2</sub> -VASc score	Recommended antithrombotic therapy
One 'major' risk factor or $\geq$ 2 'clinically relevant non-major' risk factors	$\geq$ 2	OAC <sup>a</sup>
One 'clinically relevant non-major' risk factor	1	Either OAC <sup>a</sup> or aspirin 75-325 mg daily. Preferred: OAC rather than aspirin.
No risk factors	0	Either aspirin 75-325 mg daily or no antithrombotic therapy. Preferred: no antithrombotic therapy rather than aspirin.

**Table 2: CHADS<sub>2</sub> and CHA<sub>2</sub>DS<sub>2</sub>VASc Score**

CHADS <sub>2</sub> -> CHA <sub>2</sub> DS <sub>2</sub> VASc			
CHADS <sub>2</sub> Risk	Score	CHA <sub>2</sub> DS <sub>2</sub> -VASc Risk	Score
CHF	1	CHF or LVEF $\leq$ 40%	1
Hypertension	1	Hypertension	1
Age > 75	1	Age $\geq$ 75	2
Diabetes	1	Diabetes	1
Stroke or TIA	2	Stroke / TIA / Thromboembolism	2
		Vascular Disease	1
		Age 65-74	1
		Female	1

**Table 4: Bleeding Risk Scores in AF**

Atria		HAS-BLED		HEMORR <sub>2</sub> HAGES	
Anemia	3	HT	1	Hepatic or renal disease	1
Severe renal disease	3	Abnormal renal or liver function	1	Ethanol abuse	1
Age $\geq$ 75 years	2	Stroke	1	Malignancy	1
Any prior haemorrhage	1	Bleeding	1	Older age (> 75 years)	1
HT	1	Labile INR	1	Reduced platelet count or function	1
		Elderly (> 65 years)	1	Rebleeding	2
		Drug or alcohol use	1	HT	1
				Anemia	1
				Genetic factors	1
				Excessive fall risk	1
				Stroke	1

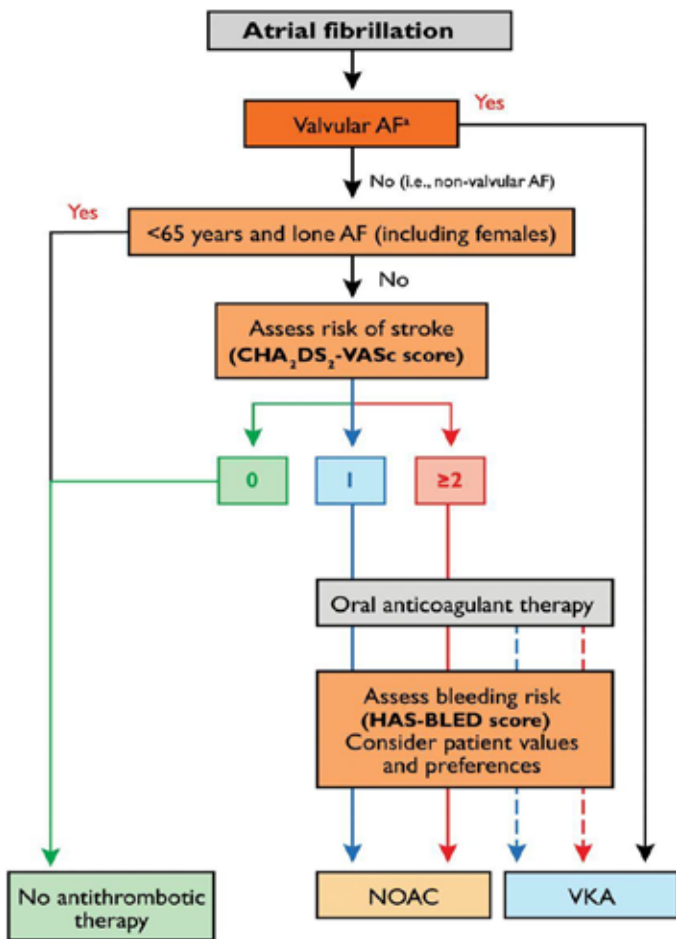
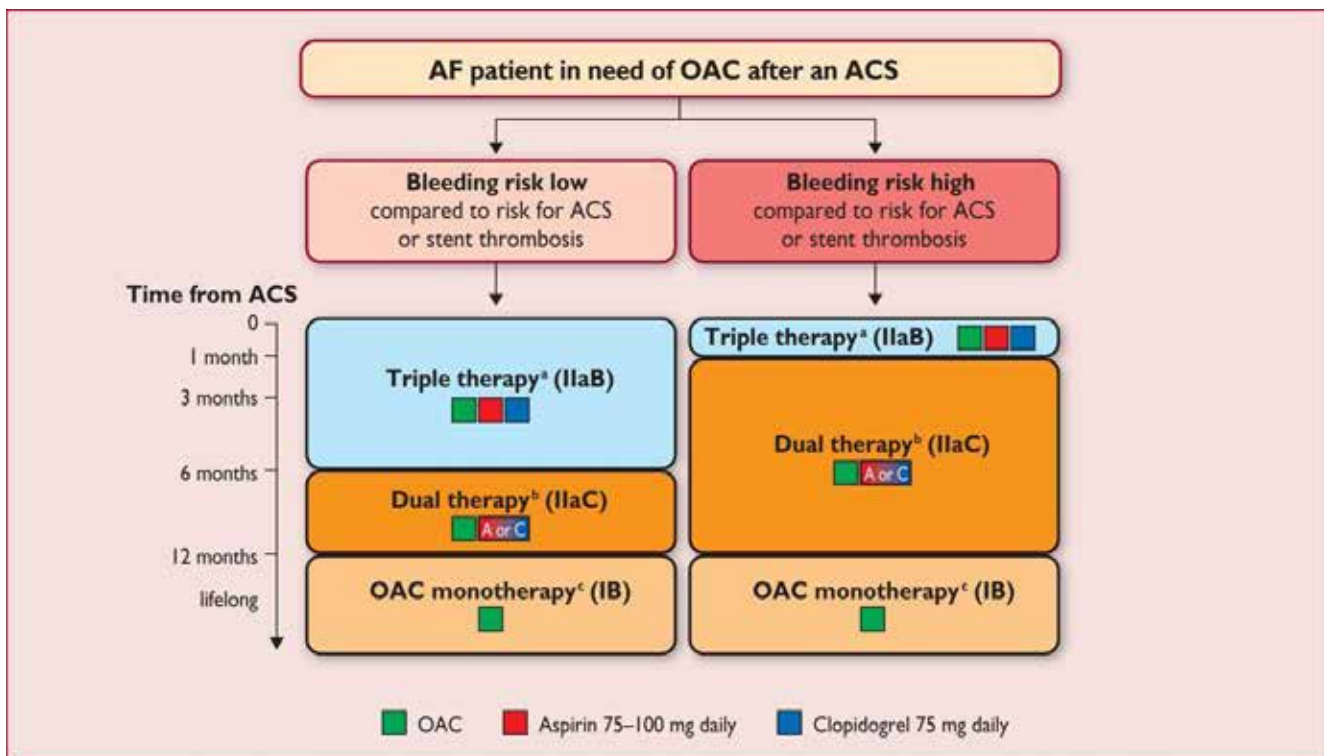


Fig. 2: Management of Atrial Fibrillation

due to inflammation or malnutrition and lack of protein in their diets. VKA overdose is frequent in these situations and hence INR should be monitored closely, every 15–21 days (Figure 2).

Novel oral anticoagulants (NOACS), on the contrary, do not require INR monitoring and are rapidly getting popular even among the elderly. NOACS currently used in clinical practice include dabigatran which is a direct thrombin inhibitor, and rivaroxaban, apixaban, and edoxaban which are direct factor Xa inhibitors.

In patients 75 years or older with AF after an acute coronary syndrome and revascularization, triple antithrombotic therapy (aspirin, clopidogrel plus oral anticoagulant) for a minimum of 4 weeks and up to a maximum of 6 months should be administered. Because of the high risk of bleeding in the elderly, the duration of this therapy should not last more than 4 weeks, and bare metal stent should be selected. Afterward, patients will continue treatment with dual therapy (antiplatelet agent plus oral anticoagulant) for 1 year (Figure 3). In such a case, clopidogrel plus VKA seems to have a better hemorrhagic profile than clopidogrel plus acetylsalicylic acid plus VKA, with no inferiority to stent thrombosis. Patients 75 years or older with AF with stable CAD who underwent revascularization should receive triple therapy for 2–4 weeks and proceed to dual therapy for 1–12 months (Figure 4). Bare metal stenting should be preferred (Figure 5) in such a case also. In patients without a revascularization procedure, a single treatment



ACS = acute coronary syndrome; AF = atrial fibrillation; OAC = oral anticoagulation (using vitamin K antagonists or non-vitamin K antagonist oral anticoagulants);

PCI = percutaneous coronary intervention.

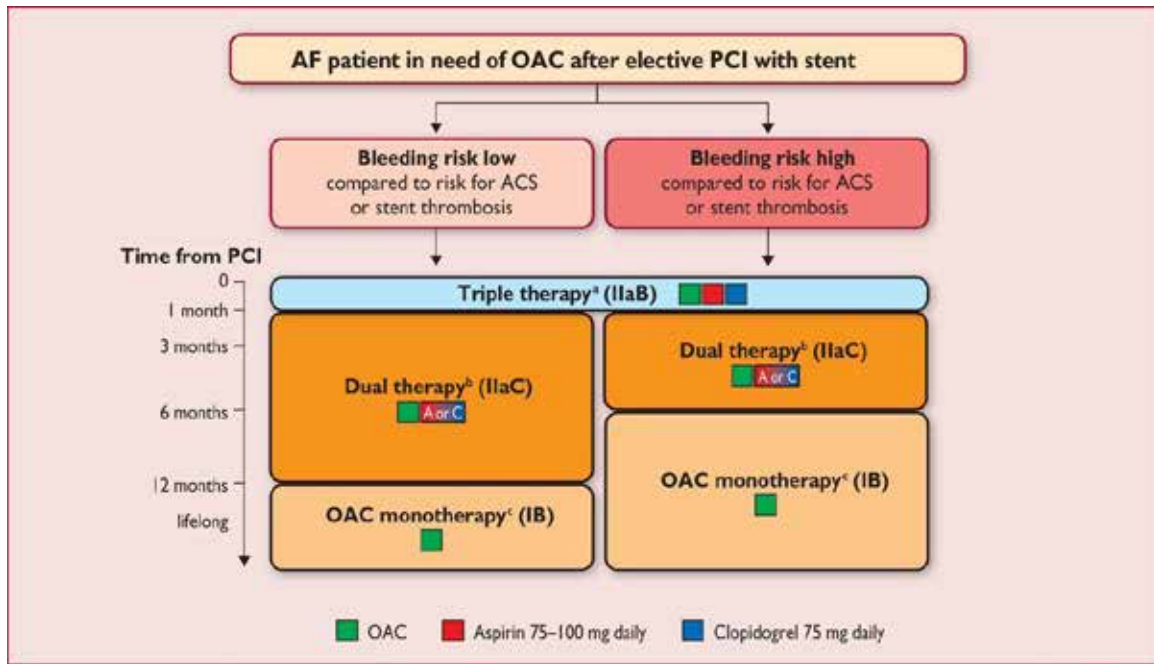
\*Dual therapy with OAC and aspirin or clopidogrel may be considered in selected patients, especially those not receiving a stent or patients at a longer time from the index event.

^OAC plus single antiplatelet.

^Dual therapy with OAC and an antiplatelet agent (aspirin or clopidogrel) may be considered in patients at high risk of coronary events.

Fig. 3: Antithrombotic therapy after an acute coronary syndrome in atrial fibrillation patients requiring anticoagulation





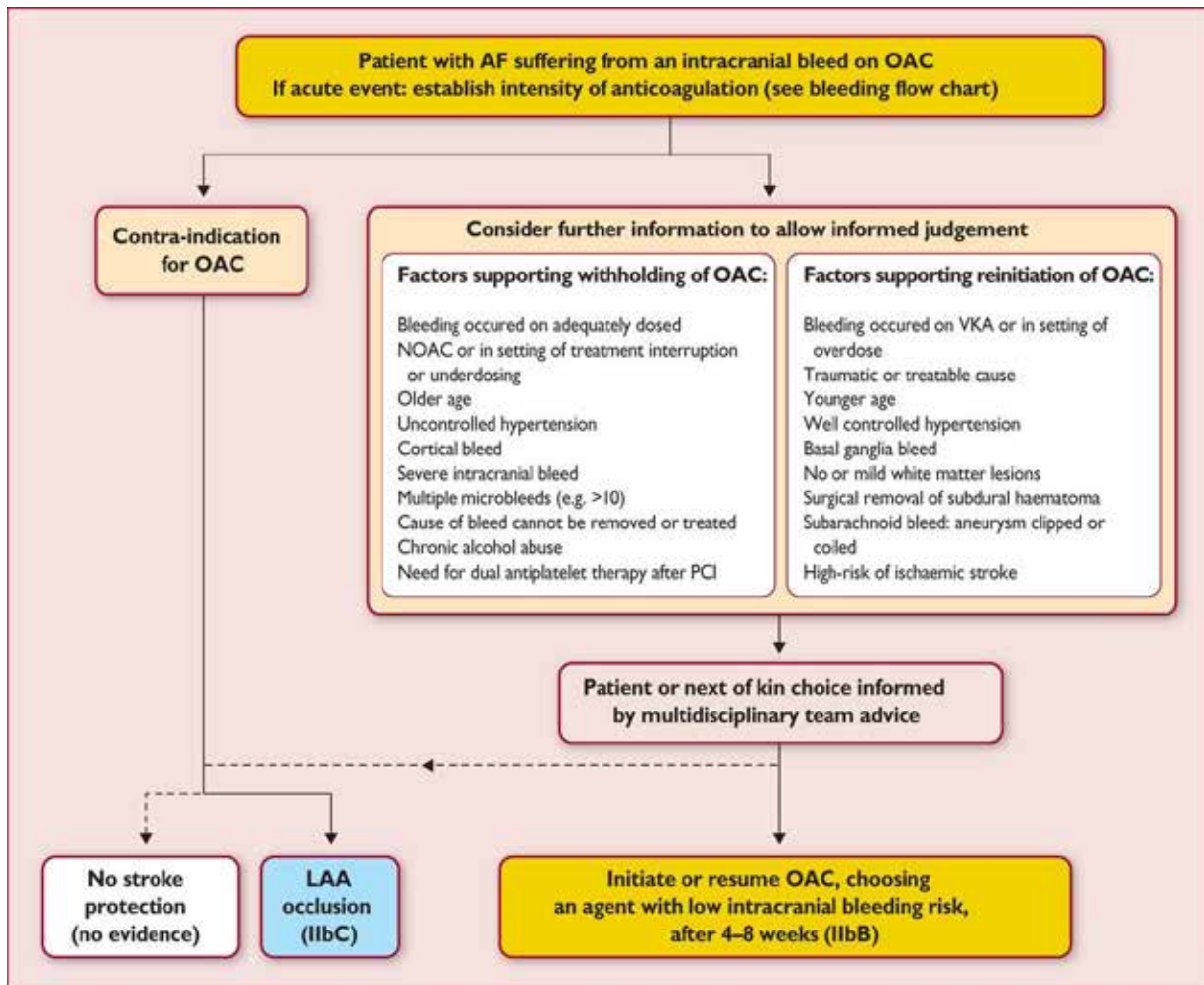
ACS = acute coronary syndrome; AF = atrial fibrillation; OAC = oral anticoagulation (using vitamin K antagonists or non-vitamin K antagonist oral anticoagulants); PCI = percutaneous coronary intervention.

<sup>a</sup>Dual therapy with OAC and aspirin or clopidogrel may be considered in selected patients.

<sup>b</sup>OAC plus single antiplatelet.

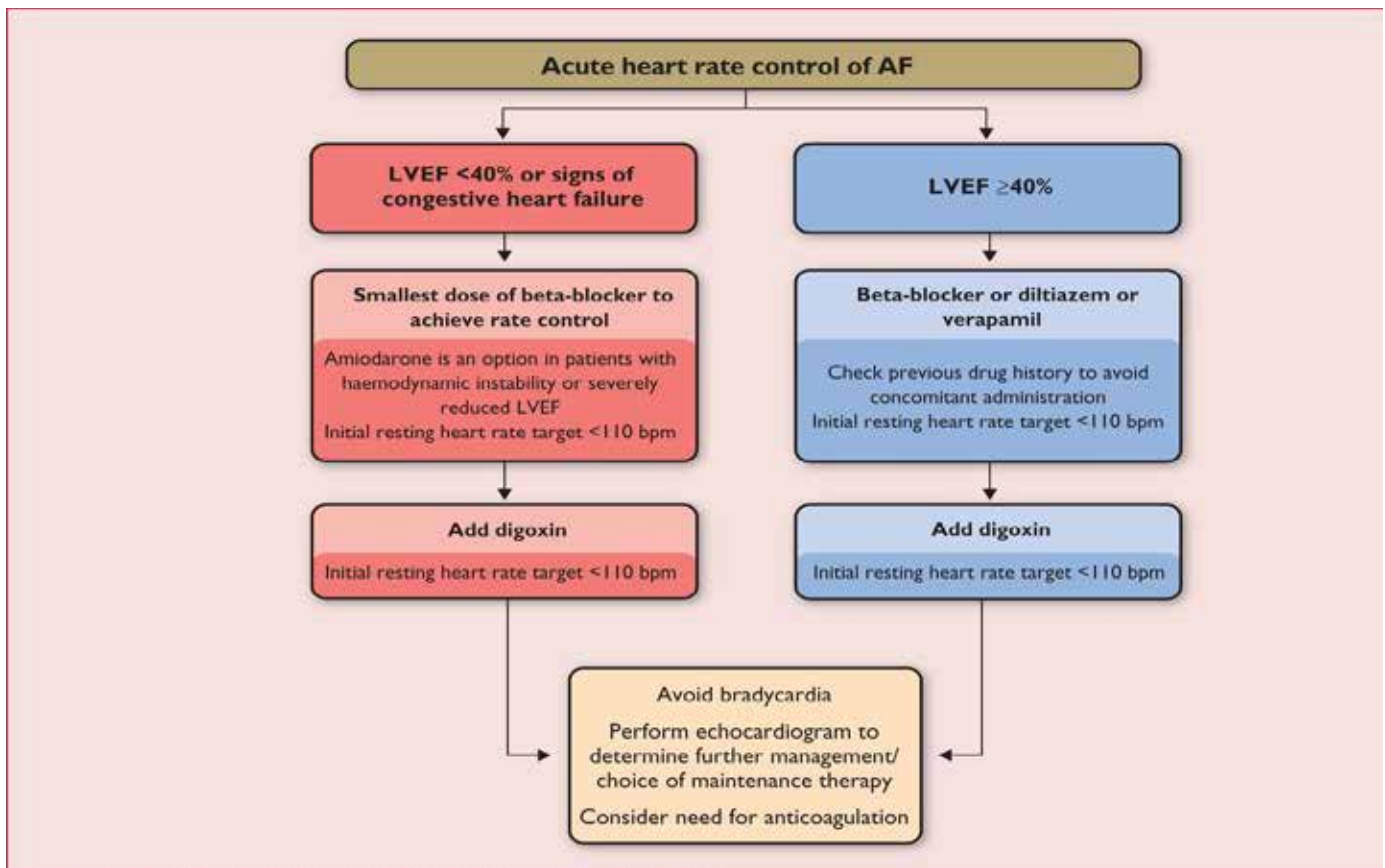
<sup>c</sup>Dual therapy with OAC and an antiplatelet agent (aspirin or clopidogrel) may be considered in patients at high risk of coronary events.

**Fig. 4 : Antithrombotic therapy after elective percutaneous intervention in atrial fibrillation patients requiring anticoagulation**



AF = atrial fibrillation; LAA = left atrial appendage; NOAC = non-vitamin K antagonist oral anticoagulant; OAC = oral anticoagulation; PCI = percutaneous coronary intervention; VKA = vitamin K antagonist.

**Fig. 5: Initiation or Resumption of Anticoagulation in Atrial Fibrillation Patients after an Intracranial Bleed**



See Table 15 for medication dosage. Digitoxin is a suitable alternative to digoxin, where available.  
AF = atrial fibrillation; bpm = beats per minute; LVEF = left ventricular ejection fraction.

**Fig. 6: Acute Heart Rate Control in Atrial Fibrillation**

with VKAs or NOAC seems to be sufficient. It should be noted that newer antiplatelets are not yet approved in triple therapy and prasugrel is contraindicated in patients aged 75 and over.

### PERCUTANEOUS LEFT ATRIAL APPENDAGE CLOSURE

Many patients, particularly the elderly, cannot tolerate or even refuse to receive chronic anticoagulation therapy. As an alternative to systemic anticoagulation, a new invasive procedure has been evolved, the percutaneous left atrial appendage (LAA) closure. Approximately 90% of the left atrial thrombi originate from the LAA, and its successful occlusion can significantly reduce the thromboembolic risk. Patients with nonvalvular AF, at high stroke risk and contraindications for OACs are possible candidates for this technique.

### ANTIARRHYTHMIC DRUGS IN ELDERLY PATIENTS

**Rate control :** In the elderly patients, especially the asymptomatic ones, rate control is the first-line therapy.  $\beta$ -blockers are the most effective at achieving that goal (Figure 6). Digoxin is recommended in acute heart failure, but has been proven to be an independent risk factor for death in patients without heart failure and should be used cautiously in the elderly in whom renal function is delicate.

**Rhythm control :** In an elderly patient with recurrences of AF despite receiving rhythm control medication, further attempts at restoring sinus rhythm are not suggested.

Cardioversion, whether electrical or pharmaceutical, is related to serious side effects in the elderly and unless AF  $\leq$  48 hours, and OAC must be documented for at least 3 weeks. Amiodarone is the safest choice in pharmaceutical cardioversion in the elderly (Figure 7).

### CATHETER ABLATION OF AF IN THE ELDERLY

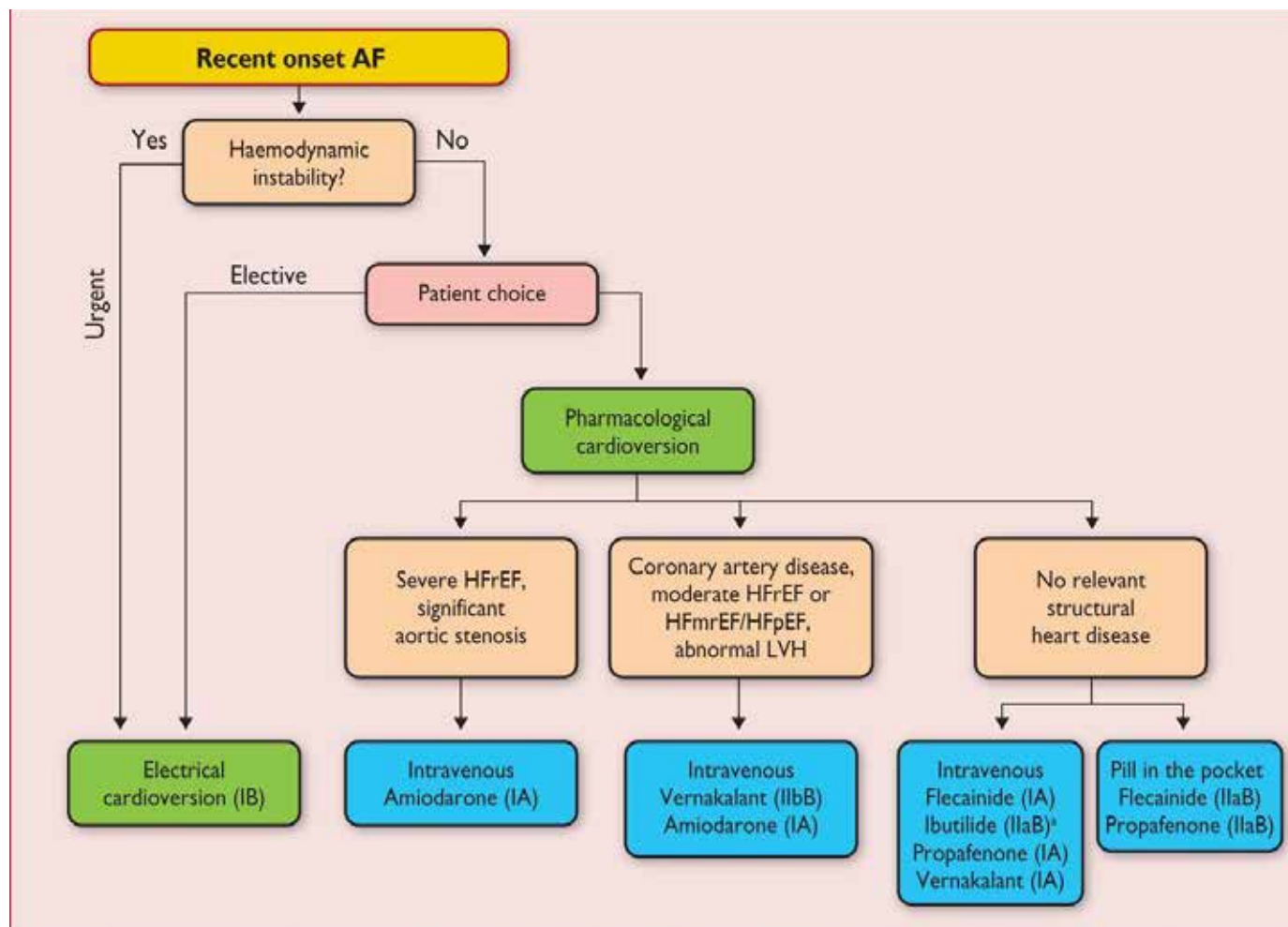
Left atrial catheter ablation has proven to be a considerable therapeutic option in maintaining sinus rhythm in patients suffering from AF. Catheter ablation is strongly contraindicated in patients with thrombus in the left atrium or in patients who cannot receive anticoagulation for at least 6–8 weeks after the procedure. Evolution in AF, ablation techniques and improved efficacy have given the elderly patients an alternative treatment for AF. Recent studies, have demonstrated similar rates of success and adverse events using radiofrequency catheter ablation between the elderly and younger patients.

### BENEFIT OF YOGA IN PATIENT WITH ATRIAL FIBRILLATION

It was found that patients who did yoga had a better quality of life, lower heart rate and lower blood pressure than patients who did not do yoga. It could be that the deep breathing balances the parasympathetic and sympathetic nervous system, leading to less variation in heart rate. The breathing and movement may have beneficial effects on blood pressure.

### CONCLUSION

Over the past decades, novel medications and therapies



AF = atrial fibrillation; HFmrEF = heart failure with mid-range ejection fraction; HFpEF = heart failure with preserved ejection fraction; HFrEF = heart failure with reduced ejection fraction; LVH = left ventricular hypertrophy.

\*Ibutilide should not be used in patients with long QT interval.

**Fig. 7: Rhythm control management of recent onset atrial fibrillation**

have been administered to the elderly patients with AF. This subgroup of patients who were neglected and undertreated now occupy the center stage. Therapies must be tailored to elderly patients, with particular attention to structural heart disease and renal failure. Elderly patients are at increased risk for thromboembolic events. Thromboembolic protection is therefore of major importance in this population. Newer anticoagulants are increasing in popularity among the elderly patients without renal failure. Elderly patients with contraindications to OAC are possible candidates for percutaneous LAA closure.

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