


Pacing Progress-
An Overview of 2023 ACC/AHA/ACCP/HRS
Atrial Fibrillation Guideline Updates

Chan Woo Kim, Pharm.D
PGY1 Pharmacy Resident
Piedmont Atlanta Hospital


Supervisor:
Naadede Badger-Plange, Pharm.D, BCPS
chanwoo.kim@piedmont.org



1

Disclosure

The speaker is a shareholder in Pfizer Inc. and Eli Lilly & Co..



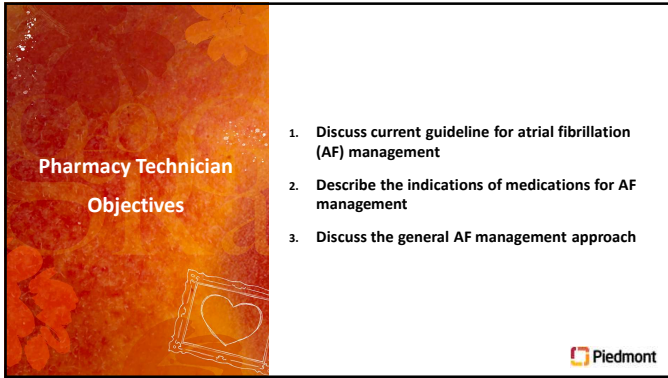
2

Pharmacist Objectives

1. Discuss current guideline for atrial fibrillation (AF) management
2. Recognize the most recent updates in the AF guideline
3. Discuss literature supporting the updated recommendations




3

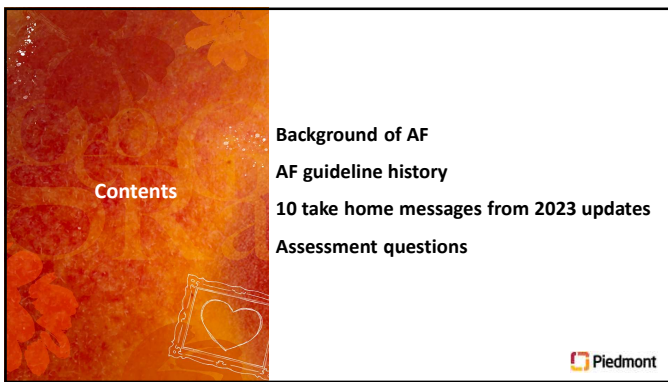


Pharmacy Technician Objectives

1. Discuss current guideline for atrial fibrillation (AF) management
2. Describe the indications of medications for AF management
3. Discuss the general AF management approach




4



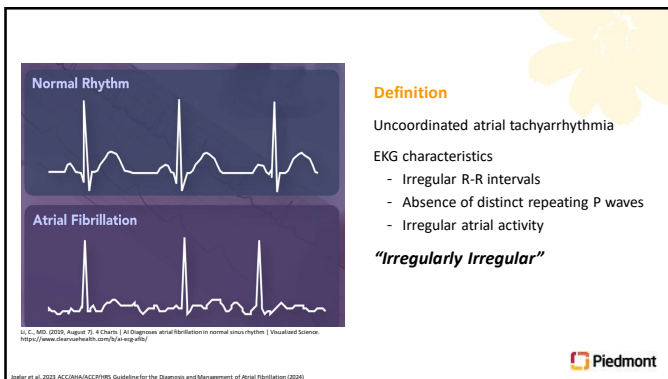
Background of AF

Contents

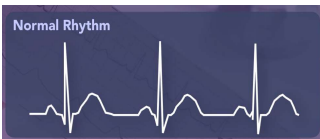
- AF guideline history
- 10 take home messages from 2023 updates
- Assessment questions




5



Normal Rhythm



Atrial Fibrillation



U.S. MD. 2015. August 19. 4 Charts | AF Diagnosis atrial fibrillation normal sinus rhythm | Visualized Science
<https://www.drxartvhealth.com/af-ecg-afib/>


Definition

Uncoordinated atrial tachyarrhythmia

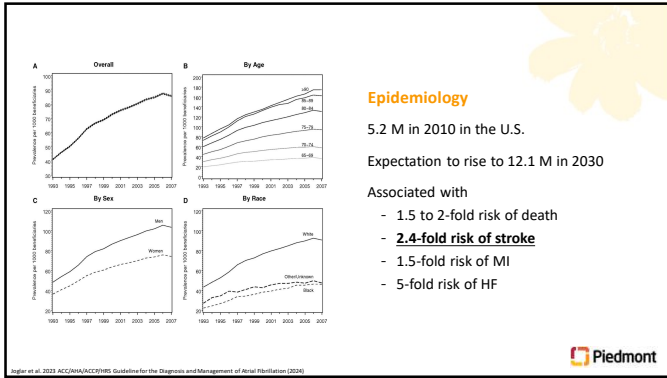
EKG characteristics

- Irregular R-R intervals
- Absence of distinct repeating P waves
- Irregular atrial activity

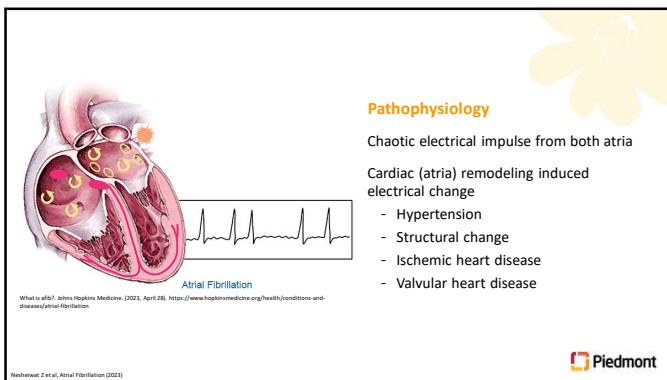
"Irregularly Irregular"



6



7



8

Management of AF

01

Rate Control
 Beta blocker
 Non-dihydropyridine calcium channel blockers

02

Rhythm Control
 Antiarrhythmic
 Cardioversion
 Catheter ablation

03


Stroke Prevention
 Anticoagulation

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9

Management of AF

01




Rate Control
Target HR < 110 BPM

Drug Class	Drug	Comment
B-blocker	metoprolol	
	carvedilol	- Asthma exacerbation
	bisoprolol	- Carvedilol needs to be taken with meals
	atenolol	
Non-dihydropyridine CCB	Diltiazem	Avoid use in heart failure patients with reduced ejection fraction
	Verapamil	
Digitalis glycoside	digoxin	Renally excreted

10

Management of AF

02



Rhythm Control
Electrical vs. chemical cardioversion

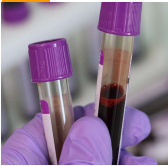
Drug Class	Drug
Class I Na⁺ Channel Blocker	Procainamide*
	Flecainide**
	Propafenone*
Class III K⁺ Channel Blocker	Amiodarone*
	Sotalol**
	Dofetilide*
	Ibutilide*

*Proarrhythmic +Negative inotropic

11

Management of AF

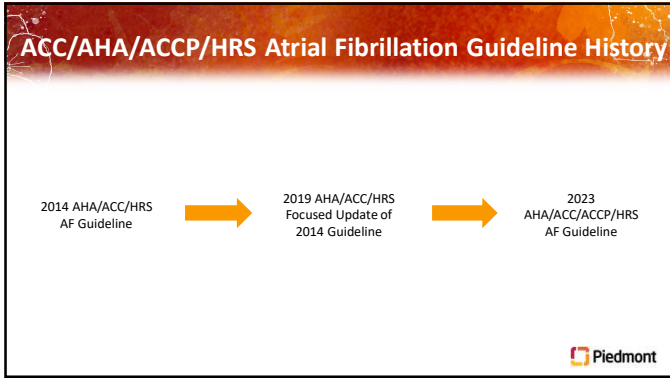
03



Stroke Prevention
AF patients have increased risk of stroke
CHA2DS2-VASc

Drug Class	Drug	Dose
Factor Xa inhibitors	Apixaban	5 mg BID
	Rivaroxaban	20 mg daily with biggest meal
	Edoxaban	60 mg daily
Vitamin K antagonist	Warfarin	Dose for target INR2-3
Direct thrombin inhibitor	Dabigatran	150 mg BID

12



13

Take Home Message #1

“The new proposed **classification**, using **stages**, recognizes AF as a **disease continuum** that requires a **variety of strategies** at the different stages.”

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14

AF Classification Changes

Term	Definition
Paroxysmal AF	-AF that terminates spontaneously or with intervention within 7 d of onset. Episodes may recur with variable frequency.
Persistent AF	-Continuous AF that is sustained >7 d.
Long-standing persistent AF	-Continuous AF >12 mo in duration.
Permanent AF	-The term “permanent AF” is used when the patient and clinician make a joint decision to stop further attempts to restore and/or maintain sinus rhythm. Acceptance of AF represents a therapeutic attitude on the part of the patient and clinician rather than an inherent pathophysiological attribute of AF. Acceptance of AF may change as symptoms, efficacy of therapeutic interventions, and patient and clinician preferences evolve.
Nonvalvular AF	-AF in the absence of rheumatic mitral stenosis, a mechanical or bioprosthetic heart valve, or mitral valve repair.

AF indicates atrial fibrillation.

AF Classification:

- Duration of episodes ONLY
- Emphasize therapeutic interventions

AF Stages:

- AF as a progressive disease
- Requires various strategies

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Nguyen et al. 2023. ACC/AHA/ACC/HRS Guideline for the Diagnosis and Management of Atrial Fibrillation (2023)

15

Assessment Question #1

Which stage of AF needs to be actively treated?

- A.Stage 1; At risk of AF
- B.Stage 2; Pre AF
- C.Stage 3; AF
- D.Stage 4; Permanent AF



19

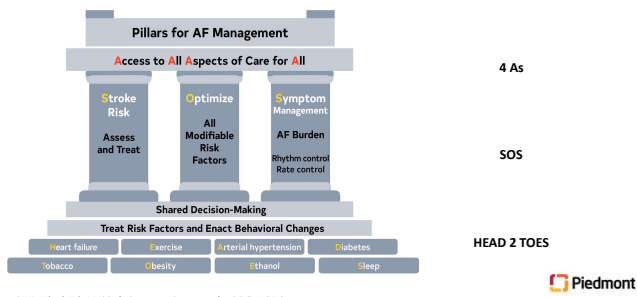
Take Home Message #2

“The guideline recognizes and emphasizes **lifestyle and risk factor modification** as a pillar of AF management to **prevent onset, progression, and adverse outcomes.**”



20

Lifestyle Risk Factor Management (LRFM)




21

Lifestyle Risk Factor Management (LRFM)


	Primary Prevention		Secondary Prevention	
	COR	LOE	COR	LOE
Overweight	1	B-NR	1	B-R
Physical inactivity	1	B-NR	1	B-R
Smoking	1	B-NR	1	B-NR
Alcohol	1	B-NR	1	B-R
Caffeine	NA	NA	3-No benefit	B-NR
Hypertension	1	B-NR	1	B-NR
Diabetes	1	B-NR	NA	NA
Sleep	NA	NA	2b	B-NR

Ng et al. 2023 ACC/AHA/ACCF/HRS Guideline for the Diagnosis and Management of Atrial Fibrillation (2023)




22

Lifestyle Risk Factor Management (LRFM)


Overweight 

- A randomized controlled study (RCT) with 150 AF patients with **BMI>27 kg/m²** showed **10% weight loss** decreased significant reduction in AF symptom burden and severity (p<0.001)¹
- Bariatric surgery in patients BMI >40 kg/m² with AF improved **sinus rhythm maintenance** after catheter ablation²

Physical inactivity 


- Moderate-to-vigorous exercise training to a target **210 mins per week**
- RCT with 51 nonpermanent AF patients demonstrated after **12 weeks of 3 times weekly exercise** reduced AF mean time (p=0.001), symptom frequency (p=0.006), and severity (p=0.009)³

1. Alabd, H. S. et al. Effect of weight reduction and cardiometabolic risk factor management on symptom burden and severity in patients with atrial fibrillation (2013)
 2. Donnellan, S. et al. Outcome of atrial fibrillation ablation in obesity after patients following bariatric surgery compared with a nonobese cohort (2019)
 3. Williams, W. et al. Aerobic resistance training reduces the burden of atrial fibrillation in the obese heart (2014)




23

Lifestyle Risk Factor Management (LRFM)


Smoking 

- An observational study with 201 patients
- AF recurrence rate **61% vs. 31%** between smoker vs. non-smoker (p<0.05)¹

Alcohol 

- A case-crossover study with 140 patients
- Increased time to AF recurrence**, HR 0.55 (p=0.005)² with reduction to **≤3 standard drinks per week for 2 weeks**

1. Swartz, A. et al. Catheter ablation for "long" atrial fibrillation (2010)
 2. Alkhatib, M. et al. Alcohol abstinence in patients with atrial fibrillation (2010)



24

Lifestyle Risk Factor Management (LRFM)

Caffeine ☕

- A single center RCT with 110 **CABG patients**
- Peri-op PO **caffeine 400 mg Q8h for 2 days**
- **Failed to show difference** in post-op AF incidence (33% vs. 29%, p=0.67)¹

Sleep 🛌

- Prevalence of **sleep-disordered breathing is remarkably high in AF patients (>20%)**
- **NO RCTs** been powered to demonstrate cause-effect relationship²

1. Legros D et al. Peri-operative oral caffeine does not prevent postoperative atrial fibrillation after heart valve surgery with cardiopulmonary bypass (2018)
2. Malhotra R et al. Prevalence and assessment of sleep-disordered breathing in patients with atrial fibrillation (2013)



25

Lifestyle Risk Factor Management (LRFM)

Hypertension 📈

- Hypertension is a stroke risk factor
- LRFM programs showed treating high BP resulted **lower incidence of AF recurrence post ablation** (p=0.0006)¹

Diabetes 🩺

- Diabetes is a stroke risk factor
- No official recommendation
- A meta-analysis with ~160,000 patients found a correlation with AF incidence²

1. Petrek M et al. Aggressive risk factor reduction study for atrial fibrillation and implications for the outcome of ablation (2014)
2. Qi W et al. Serum glycated hemoglobin level as a predictor of atrial fibrillation (2017)



26

Assessment Question #2

What is NOT a risk factor for AF?


- A. Heart Failure
- B. Obesity
- C. Caffeine
- D. Hypertension



27

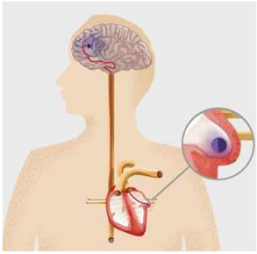
Take Home Messages #3-4

“Patients with an intermediate annual stroke risk score who remain uncertain about the benefit of anticoagulation can benefit from consideration and modification of other risk variables.”



28

Stroke Prevention



AF patients have residual blood in left atrial appendage (LAA)


Pooled blood may result in blood clot

The blood clot may block the cerebral vascular causing ischemic stroke

CHA₂DS₂-VASc score helps to predict stroke individual stroke risk

Anticoagulation recommended if score

- ≥ 2 for males
- ≥ 3 for females



29

Stroke Prevention

CHA ₂ DS ₂ -VASc risk factor	Points
C Congestive heart failure	+1
H Hypertension	+1
A₂ Age 75 years or older	+2
D Diabetes mellitus	+1
S₂ Previous stroke, transient ischaemic attack or thromboembolism	+2
V Vascular disease	+1
A Age 65-74 years	+1
Sc Sex category (female)	+1

AF patients have residual blood in left atrial appendage (LAA)


Pooled blood may result in blood clot

The blood clot may block the cerebral vascular causing ischemic stroke

CHA₂DS₂-VASc score helps to predict the ischemic stroke risk

Recommends for anticoagulation patients

- ≥ 2 for males
- ≥ 3 for females



30

Stroke Prevention

Drug Class	Drug	Dose	Renal dosing	Comments
Factor Xa inhibitors	Apixaban	5 mg PO BID	If 2 out 3 criteria met, 2.5 mg PO BID Age >80 Bodyweight <60kg Scr >1.5	DOACs are not indicated for 'valvular' AF
	Rivaroxaban	20 mg PO daily with biggest meal	CrCl with 'actual body weight' <50 mL/min, reduce to 15 mg PO daily	
	Edoxaban	60 mg PO daily	CrCl <50 mL/min, 30 mg PO daily	
Vitamin K antagonist	Warfarin	Dose for target INR 2-3	-	Monitor multiple drug interactions
Direct thrombin inhibitor	Dabigatran	150 mg PO BID	CrCl < 30 mL/min, 75 mg PO BID	

Nguyen et al. 2023 ACC/AHA/ACCP/ASPC Guidelines for the Diagnosis and Management of Atrial Fibrillation (2023)

31

Stroke Prevention

COR	LOE	Recommendations	Previous recommendation
I	A	1. For patients with AF and an elevated CHA ₂ DS ₂ -VASC score of 2 or greater in men or 3 or greater in women, oral anticoagulants are recommended.	Oral anticoagulation is recommended to AF patients with CHA ₂ DS ₂ -VASC score - ≥ 2 for males - ≥ 3 for females - NO recommendation or comments on intermediate risk populations
	B	Options include: Warfarin (LOE: A) ^{1,15,24,17} Dabigatran (LOE: B) ^{14,18} Rivaroxaban (LOE: B) ^{14,19} Apixaban (LOE: B) ^{14,19} or Edoxaban (LOE: B-R) ^{14,1,11}	New recommendation CHA ₂ DS ₂ -VASC still works as a backbone
	B	MODIFIED: This recommendation has been updated in response to the approval of edoxaban, a new factor Xa inhibitor. More precision in the use of CHA ₂ DS ₂ -VASC scores is	Patients with intermediate stroke risk can consider risk factor modification

Nguyen et al. 2023 ACC/AHA/ACCP/ASPC Guidelines for the Diagnosis and Management of Atrial Fibrillation (2023)

32

Stroke Prevention

COR	LOE	Recommendations	Previous recommendation
1	B-NR	1. Patients with AF should be evaluated for their annual risk of thromboembolic events using a validated clinical risk score, such as CHA ₂ DS ₂ -VASC ^{17,18}	Oral anticoagulation is recommended to AF patients with CHA ₂ DS ₂ -VASC score - ≥ 2 for males - ≥ 3 for females - NO recommendation or comments on intermediate risk populations
1	B-NR	2. Patients with AF should be evaluated for factors that specifically indicate a higher risk of bleeding, such as previous bleeding and use of drugs that increase bleeding risk, in order to identify possible interventions to prevent bleeding on anticoagulation ^{17,19}	New recommendation CHA ₂ DS ₂ -VASC still works as a backbone
2a	C-LD	3. Patients with AF at intermediate annual risk of thromboembolic events by risk scores (risk score not to CHA ₂ DS ₂ -VASC score of 1 in men or 2 in women), who remain uncertain about the benefits of anticoagulation, can benefit from consideration of factors that might modify their risk of stroke to help inform the decision ¹⁷	Patients with intermediate stroke risk can consider risk factor modification
3/No Benefit	B-NR	4. In patients who are deemed at high risk for stroke, bleeding risk scores should not be used in isolation to determine eligibility for oral anticoagulation but instead to identify and modify bleeding risk factors and to inform medical decision-making ¹⁸	


Nguyen et al. 2023 ACC/AHA/ACCP/ASPC Guidelines for the Diagnosis and Management of Atrial Fibrillation (2023)

33

Stroke Prevention

2013 ATRIA ¹	Age (65–74 y is 3 points, 75–84 y is 5 points, ≥85 y is 6 points), hypertension, diabetes, CHF, proteinuria, GFR <45 mL/min/1.73 m ² , sex	Includes more age categories, renal function, and proteinuria. More patients were classified as low or high risk but not as well tested in general.	11	https://www.mdcalc.com/calc/1842/atria-stroke-risk-score
2017 GARFIELD-AF ³	Web-based, uses routinely collected clinical data, and includes a total of 16 questions	Web-based tool for predicting stroke and mortality, includes the effect of the different anticoagulants, bleeding risk and mortality to facilitate shared decision-making on the potential benefits/risks of anticoagulation	4	https://af.garfieldregistry.org/garfield-af-risk-calculator

Kajzer et al. 2023. ACC/AHA/ACCF/HRS Guideline for the Diagnosis and Management of Atrial Fibrillation (2023)




34

Assessment Question #3

From the following patients, who is considered as 'intermediate stroke risk' patient?


A.CR, male, CHA2DS2VASc score is 4
 B.GH, female, CHA2DS2VASc score is 3
 C.IB, female, CHA2DS2VASc score is 1
 D.TS, male, CHA2DS2VASc score is 1



35

Take Home Message #5

“The guideline emphasizes the importance of **early and continued management** of patients with AF that should focus on maintaining sinus rhythm and minimizing AF burden.”




36

2014-2019 AF Guideline Rhythm Control

Long-term AF management may attempt to restore and maintain sinus rhythm, commonly referred to as "a rhythm-control strategy," using a combination of approaches, including cardioversion, antiarrhythmic drugs, and radiofrequency catheter ablation in the setting of appropriate anticoagulation and rate control. RCTs comparing outcomes of a rhythm-control strategy using antiarrhythmic drugs with a rate-control strategy in patients with AF failed to show a superiority of rhythm control on mortality for either strategy.^{269,313} Furthermore, when applied in patients who are candidates for both treatment strategies (rhythm or rate control), a rhythm-control strategy results in more hospitalizations. Therefore, the routine use of a rhythm-control strategy is not warranted for some patients. Catheter ablation has not been studied in this context.

Early rhythm control for symptomatic patients ONLY




Page 6, et al. 2014 AHA/ACC/AHA guideline for the management of atrial fibrillation (2014)

37

2014-2019 AF Guideline Rhythm Control

Drug Class	Drug	ADR
Class I Na ⁺ Channel Blocker	procainamide*	Agranulocytosis, AV block, Exacerbation of HFrEF Hypotension, Neutropenia, QT prolongation, Thrombocytopenia
	flecainide**	Atrial flutter, AV block, Dyspnea, Exacerbation of HFrEF QT prolongation, VT, Visual disturbances
	propafenone*	
Class III K ⁺ Channel Blocker	amiodarone**	Bradycardia, Hypotension, QT prolongation Interaction with warfarin
	sotalol†	AV block, Bradycardia, Bronchospasm Exacerbation of HFrEF, Fatigue, QT prolongation
	dofetilide*	QT prolongation
	ibutilide*	Non-sustained VT, QT prolongation




Page 6, et al. 2014 ACC/AHA/ACC/HRS Guideline for the Diagnosis and Management of Atrial Fibrillation (2014)

38

2023 New Guideline

2a	B-R	3. In patients with a recent diagnosis of AF (<1 year), rhythm control can be useful to reduce hospitalizations, stroke, and mortality. ¹²⁻¹⁴
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Page 6, et al. 2023 ACC/AHA/ACC/HRS Guideline for the Diagnosis and Management of Atrial Fibrillation (2023)

39


2023 New Guideline

2a

B-R

3. In patients with a recent diagnosis of AF (<1 year), rhythm control can be useful to reduce hospitalizations, stroke, and mortality.¹²⁻¹⁴

A RCT found that rhythm control was associated with a 25% reduction in the combined endpoint of mortality rate, stroke, and hospitalizations due to HF or ACS.



Engel et al. 2023. ACC/AHA/ACCF/HRS Guidelines for the Diagnosis and Management of Atrial Fibrillation (2023)

40

EAST-AFNET4 Trial- Introduction

EAST - AFNET 4 trial population
2789 patients with atrial fibrillation diagnosed within a year prior to randomization and cardiovascular conditions approximating a CHA₂DS₂-VASc score of ≥ 2
2633 with known AF-related symptoms (EHRA score) at baseline
randomized to Early Rhythm Control or Usual Care

Early Rhythm Control in all patients (n=1305/2633)		Usual Care, including symptom-directed rhythm control therapy (n=1328/2633)	
Asymptomatic at baseline (n=395)	Symptomatic at baseline (n=910)	Asymptomatic at baseline (n=406)	Symptomatic at baseline (n=922)

No difference in treatment pattern between asymptomatic and symptomatic patients.
Excellent symptom control in both randomized groups at two years.

Ca. 1/4 treated with AF ablation and 3/4 treated with antiarrhythmic drugs at 2 years


Ca. 8% treated with AF ablation and 9% treated with antiarrhythmic drugs at 2 years

Aim

- Present guideline recommends early rhythm control therapy to symptomatic AF patients.
- The study investigated if early, systemic rhythm control improves prognosis

Method

International, parallel-group, open-blinded outcome-assessment



Williams, B. et al. Systematic early rhythm control strategy for atrial fibrillation in patients with or without symptoms (2022)

41

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Ca. 1/4 treated with AF ablation and 3/4 treated with antiarrhythmic drugs at 2 years


Ca. 8% treated with AF ablation and 9% treated with antiarrhythmic drugs at 2 years

Total 2633 patients were randomized

Stratified by European Heart Rhythm Association (EHRA)

- asymptomatic (EHRA I)
- mildly symptomatic (EHRA II)
- severely symptomatic (EHRA III or EHRA IV)

Primary outcome: CV death, stroke, hospitalization for HF or ACS



Williams, B. et al. Systematic early rhythm control strategy for atrial fibrillation in patients with or without symptoms (2022)

42

EAST-AFNET4 Trial- Results

Table 2 Rhythm control planned at baseline and present at 24 months by EHRA score and randomized

	EHRA I		EHRA II		EHRA III/IV	
	Early rhythm control	Usual care	Early rhythm control	Usual care	Early rhythm control	Usual care
n	395	406	666	692	244	230
Rhythm control at BL						
AF ablation	24 (6.1)	1 (0.2)	35 (8.3)	0 (0.0)	23 (9.4)	1 (0.4)
Dronedronone	71 (18.2)	0 (0.0)	38 (13.2)	0 (0.0)	42 (25.4)	1 (0.4)
Amiodarone	62 (20.8)	7 (1.7)	119 (17.9)	12 (1.7)	40 (24.4)	7 (3.0)
Rasazide	127 (32.2)	4 (1.5)	271 (40.7)	19 (1.4)	42 (25.4)	5 (2.2)
Propafenone	35 (8.9)	1 (0.2)	48 (7.2)	1 (0.1)	13 (5.3)	0 (0.0)
Other antiarrhythmic drug	38 (9.6)	1 (0.2)	46 (6.9)	0 (0.0)	18 (7.4)	1 (0.4)
None	17 (4.3)	390 (96.1)	39 (5.9)	669 (96.7)	4 (2.5)	215 (93.5)
Rhythm control at FU24						
AF ablation	75 (19.0)	24 (5.9)	124 (18.4)	44 (6.4)	52 (21.3)	19 (8.3)
Dronedronone	23 (5.8)	1 (0.2)	38 (4.2)	2 (0.3)	26 (10.7)	2 (0.9)
Amiodarone	49 (12.4)	11 (2.7)	73 (11.0)	15 (2.2)	34 (13.9)	12 (5.2)
Rasazide	57 (14.4)	5 (1.2)	179 (26.6)	26 (3.8)	34 (13.9)	5 (2.2)
Propafenone	19 (4.8)	3 (0.7)	26 (3.9)	9 (1.3)	7 (2.9)	4 (1.7)
Other antiarrhythmic drug	19 (4.8)	2 (0.5)	17 (2.6)	2 (0.3)	7 (2.9)	1 (0.4)
None	151 (38.2)	360 (88.7)	225 (33.8)	654 (95.4)	84 (34.4)	187 (81.3)

AF, atrial fibrillation; FU24, 24 months follow-up.

Callout: No significant difference in treatment plan among asymptomatic group and symptomatic groups

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Williams, B. et al. Systematic early rhythm control strategy for atrial fibrillation in patients with or without symptoms (2022)

43

EAST-AFNET4 Trial- Results

Table 3 Outcomes in the EAST-AFNET4 trial population by symptom status

Outcome	Asymptomatic (EHRA I)			Mild or moderate symptoms (EHRA II)			Severe symptoms (EHRA III/IV)			P-value interaction
	Early rhythm control	Usual care	Treatment effect	Early rhythm control	Usual care	Treatment effect	Early rhythm control	Usual care	Treatment effect	
First primary outcome	79 (19.8)	103 (25.5)	-0.27 (0.37, 0.83)	109 (30.4)	101 (29.1)	0.04 (0.16, 0.08)	40 (20.9)	48 (20.9)	0.08 (0.41, 0.26)	0.743
Components of the primary outcome										
Death from cardiovascular cause	19 (20.0)	25 (19.2)	0.73 (0.4, 1.33)	14 (20.0)	15 (19.2)	0.7 (0.36, 1.37)	6 (18.8)	6 (18.8)	0.00 (0.18, 0.17)	0.979
Stroke	30 (19.6)	34 (19.6)	0.07 (0.44, 1.07)	35 (19.2)	34 (19.6)	0.06 (0.48, 1.33)	11 (14.1)	10 (13.9)	0.06 (0.35, 0.23)	0.492
Hospitalization with worsening of heart failure	22 (20.0)	18 (19.2)	0.01 (0.44, 0.42)	18 (20.0)	18 (19.2)	0.01 (0.34, 0.31)	10 (18.0)	12 (14.1)	0.42 (0.35, 0.18)	0.229
Hospitalization with acute coronary syndrome	3 (3.1)	6 (5.7)	-0.31 (0.72, 1.10)	3 (3.0)	6 (5.7)	-0.27 (0.99, 1.45)	8 (12.4)	8 (11.8)	0.19 (0.87, 0.49)	0.193
Secondary primary outcome— nights spent in hospital	0.3 (0.4)	0.1 (0.3)	0.28 (0.42, 0.33)	0.1 (0.3)	0.1 (0.3)	0.06 (0.42, 0.3)	0.1 (0.4)	0.1 (0.3)	-0.44 (-0.31, 0.16)	0.287
Key secondary outcomes at 2 years										
Change in left ventricular ejection fraction	0.4 (0.4)	-0.3 (0.6)	0.78 (-1.16, 1.36)	0.4 (0.4)	-0.3 (0.6)	0.74 (-0.82, 1.3)	0.3 (0.4)	-0.1 (0.7)	0.56 (-1.06, 1.17)	0.302
Change in ECG score	1.4 (1.6)	-1.2 (1.7)	2.6 (0.74, 4.46)	1.1 (1.6)	-1.2 (1.7)	2.3 (1.26, 3.89)	1.4 (1.6)	-1.0 (1.1)	2.4 (1.38, 3.42)	0.297
Change in SF-12 mental score	1 (0.7)	1 (1.0)	-0.01 (0.31, 0.29)	1 (1.0)	1 (1.0)	-0.01 (0.31, 0.29)	1 (1.0)	1 (1.0)	-0.01 (0.31, 0.29)	0.988
Change in SF-12 physical score	-0.4 (0.3)	-1.2 (0.6)	0.84 (0.37, 1.31)	0.5 (0.3)	-1.2 (0.6)	0.67 (0.10, 1.24)	1.3 (0.9)	1.3 (0.9)	0.00 (-1.3, 1.28)	0.636
Change in PULCA score	0.2 (0.4)	0.1 (0.3)	0.05 (0.42, 0.33)	0.1 (0.3)	0.1 (0.3)	-0.06 (0.42, 0.3)	0.1 (0.4)	0.1 (0.3)	-0.44 (-0.31, 0.16)	0.194
Sinus rhythm	350 (33.2)	370 (35.3)	-0.02 (0.24, 0.20)	400 (38.6)	370 (35.3)	0.03 (0.41, 0.36)	166 (19.9)	161 (18.7)	0.05 (0.31, 0.21)	0.287

Callout: P-value did not show any significant difference in asymptomatic vs. symptomatic groups in terms of primary outcome

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Williams, B. et al. Systematic early rhythm control strategy for atrial fibrillation in patients with or without symptoms (2022)

44

EAST-AFNET4 Trial- Results

Table 4 Safety outcomes for EHRA score

	EHRA I		EHRA II		EHRA III/IV	
	Early rhythm control	Usual care	Early rhythm control	Usual care	Early rhythm control	Usual care
n	395	406	666	692	244	230
Primary composite safety outcome	79 (20.0)	63 (15.5)	99 (14.9)	105 (15.2)	44 (18.0)	43 (18.7)
Stroke	19 (4.8)	25 (6.2)	14 (2.1)	22 (3.2)	6 (2.5)	12 (5.2)
Death	45 (11.4)	40 (9.9)	59 (8.9)	84 (12.1)	29 (11.9)	30 (13.0)
Serious adverse event of special interest related to rhythm control therapy	22 (5.6)	4 (1.0)	31 (4.7)	8 (1.2)	12 (4.9)	5 (2.2)

Callout: NO significant difference in asymptomatic vs. symptomatic groups in terms of safety outcomes

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45

Assessment Question #4

Which antiarrhythmic medication is recommended for HFrEF patients?

- A. Amiodarone
- B. Flecainide
- C. Diltiazem
- D. Sotalol



49

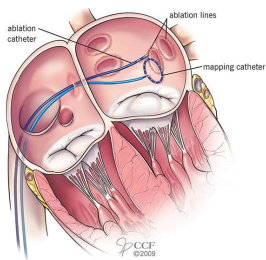
Take Home Messages #6-7

“The guideline recognized the superiority of **catheter ablation over drug therapy** for rhythm control in **heart failure with reduced ejection fraction patients.**”



50

Catheter Ablation



Catheter ablation

- Use cold or heat energy
- Destroy heart tissue
- Creates a ‘scar’ tissue
- Blocks abnormal rhythm signal

Pulmonary vein isolation (PVI)

- Recommended technique
- Where AF usually occurs



51

Catheter Ablation

Recommendation for Catheter Ablation in HF
Referenced studies that support the new recommendation are summarized in [Online Data Supplement 7](#).

COR	LOE	Recommendation
Ib	B-R	<ol style="list-style-type: none"> AF catheter ablation may be reasonable in selected patients with symptomatic AF and HF with reduced left ventricular (LV) ejection fraction (HFrEF) to potentially lower mortality rate and reduce hospitalization for HF.^{10,11,14,15,17} NEW: New evidence, including data on improved mortality rate, has been published for AF catheter ablation compared with medical therapy in patients with HF.

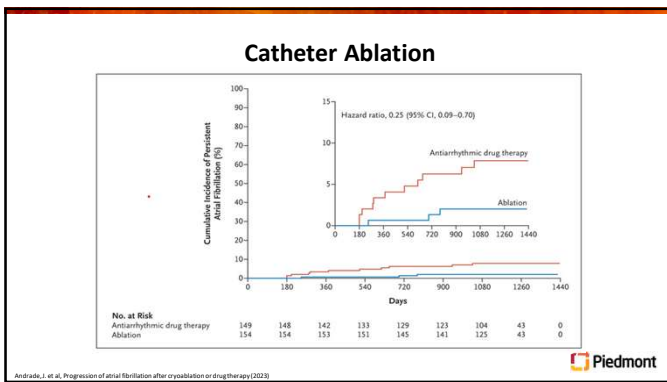
➔

Recommendations for AF Catheter Ablation
Referenced studies that support the recommendations are summarized in the [Table of Evidence](#).

COR	LOE	Recommendations
1	A	1. In patients with symptomatic AF in whom antiarrhythmic drugs have been ineffective, contraindicated, not tolerated or not preferred, and continued rhythm control is desired, catheter ablation is useful to improve symptoms. ^{10,11}
1	A	2. In selected patients (generally younger with few comorbidities) with symptomatic paroxysmal AF in whom rhythm control is desired, catheter ablation is useful as first-line therapy to improve symptoms and reduce progression to persistent AF. ¹¹⁻¹⁴
1	A	3. In patients with symptomatic or clinically significant AFL, catheter ablation is useful for improving symptoms. ¹¹⁻¹⁴

Nguyen et al. 2023. ACC/AHA/ACCF/HRS Guidelines for the Diagnosis and Management of Atrial Fibrillation (2023)

52

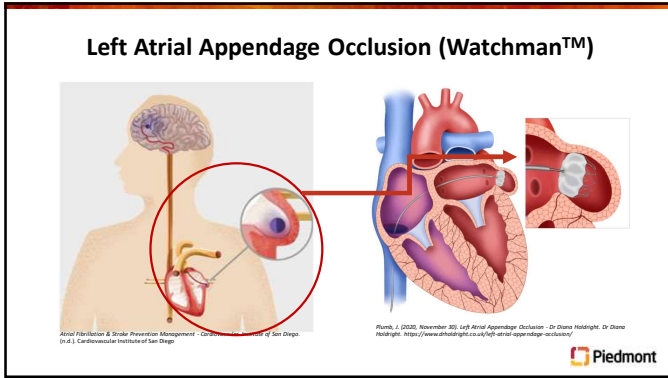


53

Take Home Message #8

“More prescriptive recommendations are provided for patients with **device-detected AF** that consider the interaction between **episode duration** and the **patient's underlying risk for thromboembolism.**”

54



58

LAA Occlusion Recommendation

Recommendation for Percutaneous Approaches to Occlude the LAA
Referenced studies that support the new recommendation are summarized in [Online Data Supplement 4](#).

COR	LOE	Recommendation
IIb	B-NR	1. Percutaneous LAA occlusion may be considered in patients with AF at increased risk of stroke who have contraindications to long-term anticoagulation. ^{1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100} NEW: Clinical trial data and FDA approval of the Watchman device necessitated this recommendation.

➔

Recommendations for Percutaneous Approaches to Occlude the LAA
Referenced studies that support the recommendations are summarized in the [online data supplement](#).

COR	LOE	Recommendations
2a	B-NR	1. In patients with AF, a moderate to high risk of stroke (CHA ₂ DS ₂ -VASc score ≥2), and a contraindication (Table 14) to long-term oral anticoagulation due to a nonreversible cause, percutaneous LAAO (pLAAO) is reasonable. ^{1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100}
2b	B-R	2. In patients with AF and a moderate to high risk of stroke and a high risk of major bleeding on oral anticoagulation, pLAAO may be a reasonable alternative to oral anticoagulation based on patient preference, with careful consideration of procedural risk and with the understanding that the evidence for oral anticoagulation is more extensive. ^{1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100}

Epstein et al. 2023 ACC/AHA/ACCP/WHF Guideline for the Diagnosis and Management of Atrial Fibrillation (2023)

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59

LAA Occlusion Recommendation

Table 14. Situations in Which Long-Term Anticoagulation Is Contraindicated and Situations When It Remains Reasonable

Long-Term Anticoagulation Contraindicated	Long-Term Anticoagulation Is Still Reasonable
Severe bleeding due to a nonreversible cause involving the gastrointestinal, pulmonary, or genitourinary systems	Bleeding involving the gastrointestinal, pulmonary, or genitourinary systems that is treatable
Spontaneous intracranial/intraspinal bleeding due to a nonreversible cause	Bleeding related to isolated trauma
Serious bleeding related to recurrent falls when cause of falls is not felt to be treatable	Bleeding related to procedural complications


Epstein et al. 2023 ACC/AHA/ACCP/WHF Guideline for the Diagnosis and Management of Atrial Fibrillation (2023)

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60

Take Home Message #10

“Emphasis is made on the **risk of recurrent AF** after AF is discovered **during noncardiac illness** or other precipitants, such as **surgery**.”




61

Noncardiac Illness Induced AF

Recommendations for Acute Medical Illness or Surgery (Including AF in Critical Care)
 Referenced studies that support the recommendations are summarized in the [Table 4.10a, Supplement 4](#).

COR	LOE	Recommendations
1	B-NR	1. Patients with AF who are identified in the setting of acute medical illness or surgery should be counseled about the significant risk of recurrent AF after the acute illness is resolved. ¹⁻⁴
2a	B-NR	2. In patients with AF who are identified in the setting of acute medical illness or surgery, outpatient follow-up for thromboembolic risk stratification and decision-making on OAC initiation or continuation, as well as AF surveillance, can be beneficial given a high risk of AF recurrence. ⁴⁻⁹
2b	B-NR	3. In patients with AF who are identified in the setting of critical illness due to sepsis, the benefits of anticoagulation during critical illness for stroke prevention are uncertain. ^{10,11}

- Non-cardiac illness induced acute AF
 - 1-46% medical illness
 - 6-22% severe sepsis
 - 3-16% noncardiac surgery
- Can be **paroxysmal or persistent**
 - **Recurrent AF noted in 42-68% of patients**
- Individualize **rate-rhythm control**
- Anticoagulation decision should be based on risk stratification



62

Post-Operational AF Management

Prevention of AF After Cardiac Surgery


Patients at high risk for postop AF: Short-term prophylactic beta-blockers or amiodarone (2a)

CABG, aortic valve, ascending aortic aneurysm operations; posterior left pericardiectomy (2a)

AF After Cardiac Surgery

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                graph TD
                    A[AF After Cardiac Surgery] --> B[Rate control with beta-blocker or diltiazem (2a)]
                    B --> C[Consider anticoagulation when deemed safe from surgical bleeding (2a)]
                    C --> D[Hemodynamically stable]
                    C --> E[Hemodynamically unstable or poorly tolerated AF]
                    D --> F[Rate control with beta-blocker or diltiazem (2a)]
                    D --> G[Rhythm control (2a)]
                    E --> H[Rate control with amiodarone, digoxin, or other drugs (2a)]
                    F --> I[Do not discontinue beta-blockers if AF does not recur by day 10 (2a)]
                    G --> I
                    H --> I
                    
```



63
