Reducing the Burden of ATRIAL FIBRILLATION:

A Whiteboard Animated Tour of Antiarrhythmic Drugs for Cardiologists

FACULTY
Info

This activity is provided by Med Learning Group.
This activity is co-provided by Ultimate Medical Academy/Complete Conference Management (CCM).
This activity is supported by an educational grant from Sanofi US.

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FACULTY

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PROGRAM OVERVIEW

This live activity targets healthcare gaps related to the treatment and management of atrial fibrillation (AF), impacting outcomes through guidelines and best practices, appropriate antiarrhythmic use and shared decision-making.

- By addressing these gaps, you can assess whether your approach to AF management through utilization of current treatment guidelines and strategies for shared decision making – could be modified to help close these gaps.
- Expert discussion will guide you in analyzing and identifying appropriate candidates for antiarrhythmic intervention, utilizing clinical trial and real-world data on efficacy and safety to affect patient outcomes.
- You will also be immersed in dynamic animations utilizing a whiteboard platform to memorably highlight key points related to antiarrhythmic mechanisms of action and consequences related to interactions with other cardiovascular agents.

TARGET AUDIENCE

This activity is designed to meet the educational needs US-based cardiologists and other HCPs involved in the care of patients with AF.

LEARNING OBJECTIVES

After completing the CME activity, learners should be better able to:

- Discuss current guidelines and best practices to improve outcomes for patients with AF in clinical practice
- Review clinical trial and real-world data on the efficacy and safety of antiarrhythmic drugs used for the management of AF
- Adopt shared decision-making approaches aimed at improving patient outcomes in clinical practice

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Purpose: This program would be beneficial for nurses involved and/or interested in the therapeutic management of patients with atrial fibrillation.

Credits: 1.0 ANCC Contact Hour

CNE Accreditation Statement: Ultimate Medical Academy/Complete Conference Management (CCM) is accredited as a provider of continuing nursing education by the American Nurses Credentialing Center's Commission on Accreditation. Awarded 1.0 contact hour of continuing nursing education of RNs and APNs.

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Dr. Kenneth Ellenbogen reports that he is on the Speakers Bureau, serves as a consultant and has completed contracted research for Abbott, Biosense, Boston Scientific, Medtronic and Webster.

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Dr. John Osborne has no relationships to disclose

Dr Jonathan Piccini reports that he has worked as a Consultant for Abbott, AbbVie, Biotronik, Medtronic, Milestone, Sanofi and Philips. He has also received grants from AHA, AAMI, Bayer, Boston Scientific and Philips

Dr James Reiffel reports that he is on the Speakers Bureau for Sanofi, works as a consultant for Acesion Pharma, Amarin, Correvio and Medtronic, and provides research support to Johnson & Johnson and Janssen

CME Content Review

The content of this activity was independently peer reviewed.
The reviewer of this activity has nothing to disclose.

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1. Read the CME/CNE information and faculty disclosures;

2. Participate in the live activity; and

3. Complete pre-and-post surveys and evaluation.

You will receive your certificate as a downloadable file.

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Reducing the Burden of Atrial Fibrillation: A Whiteboard Animated Tour of Antiarrhythmic Drugs for Cardiologists

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Disclosures

- Please see Program Overview for specific speaker disclosure information.
- During this lecture, the faculty may mention the use of medications for both FDA-approved and nonapproved indications.

Supported by an educational grant from Sanofi Genzyme and Regeneron Pharmaceuticals.

Educational Objectives

- Discuss current guidelines and best practices to improve outcomes for patients with atrial fibrillation (AF) in clinical practice
- Review clinical trial and real-world data on the efficacy and safety of antiarrhythmic drugs used for the management of AF
- Adopt shared decision-making approaches aimed at improving patient outcomes in clinical practice

AF: A Significant Healthcare Issue

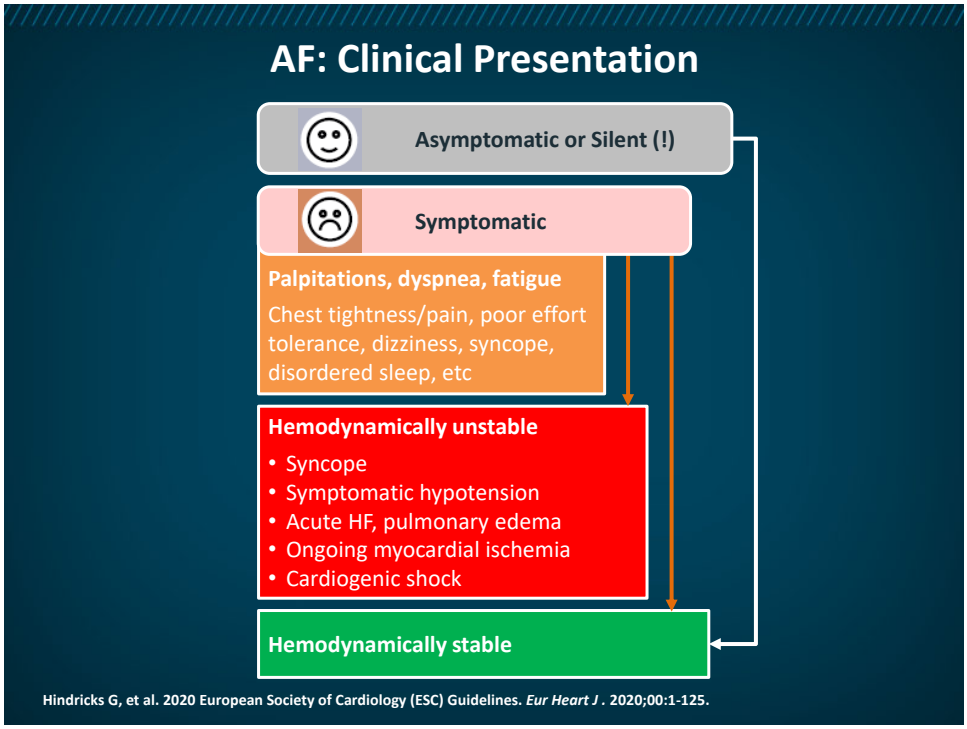
AF affects ~ **3-6 million people** in the US; important to differentiate:

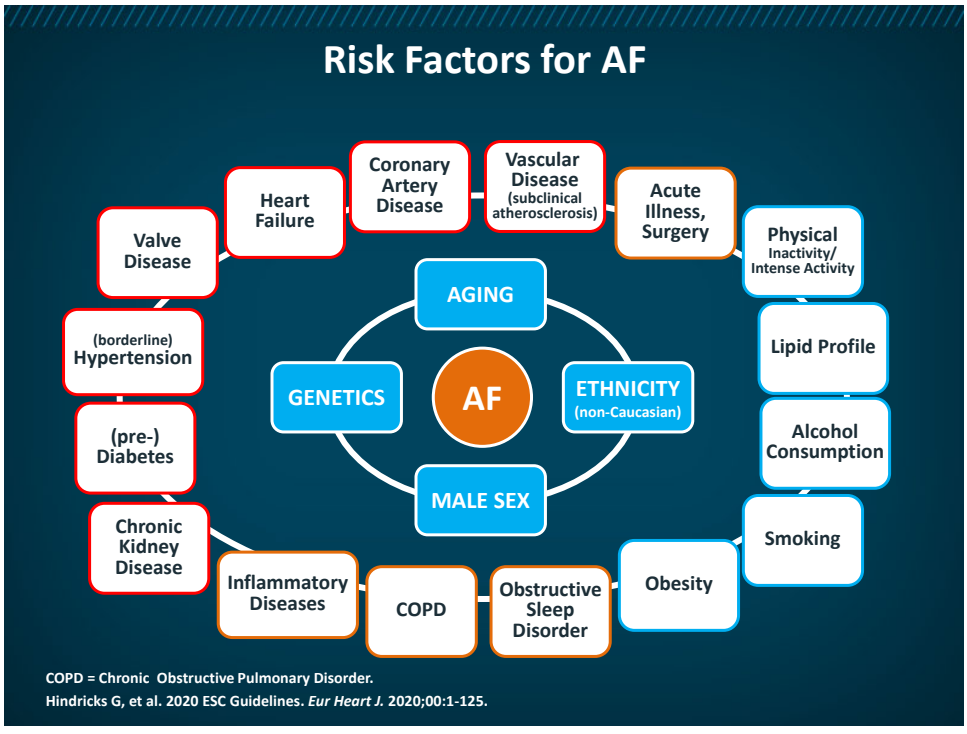
- AF is associated with increases in aging and chronic heart disease (especially HF)
- **Median age 75 y**, although *70% are between 65 and 85 y and 84% > 65 y*

AF *frequently* presents with comorbidities; does this complicate AF management?	Comorbidities complicate AF management ⟷ AF complicates comorbidity management
Is hospitalization for AF common or uncommon?	*Most common arrythmia* requiring hospitalization (454,000 hospital hospitalizations with primary diagnosis)
AF is associated with stroke, HF, & death. How many deaths/y does **AF contribute to**?	**158,000** patient deaths/y
Is AF incidence over, under, or appropriately estimated?	**Underestimated** due to lack of symptoms; silent AF (45% of Stroke Prevention in Atrial Fibrillation [SPAF] III Study had AF detected incidentally)

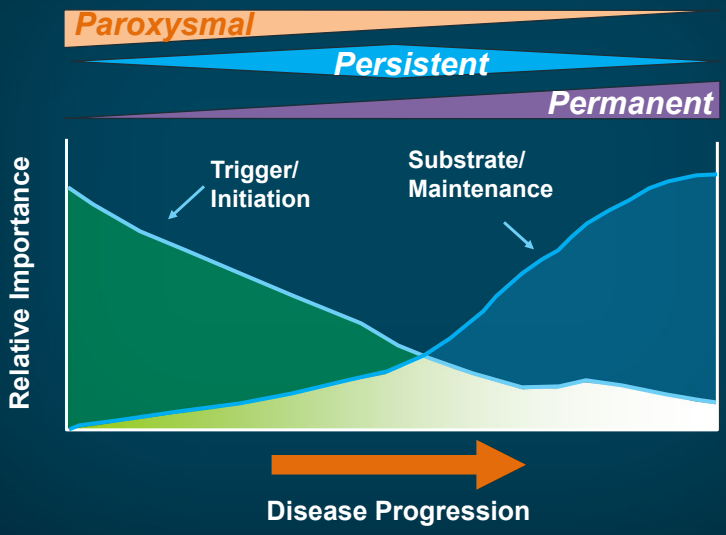
AF = atrial fibrillation; US = United States; HF = heart failure.

Fuster V, et al. *Circulation*. 2006;114:700-752. Thom T, et al. *Circulation*. 2006;113:e85-e151. Feinberg W, et al. *Arch Intern Med*. 1995;155:469-473. Waktare J, et al. *Am J Cardiol*. 1998;81:3C-15C. Benjamin E, et al. *Circulation*. 1998;98:946-952. Wang T, et al. *Circulation*. 2003;107:2920-2925. Miyasaka Y, et al. *Circulation*. 2006;114:119-125. Chugh S, et al. *J Am Coll Cardiol*. 2001;37:371-378. CDC. What is atrial fibrillation? 2020 (https://www.cdc.gov/heartdisease/atrial_fibrillation.htm). Accessed October 19, 2020. ACC. Impact and consequences of atrial fibrillation. 2018 (https://www.acc.org/latest-in-cardiology/articles/2018/08/06/12/42/cover-story-impact-and-consequences-of-atrial-fibrillation). Accessed October 19, 2020.


AF: Clinical Presentation
Asymptomatic or Silent (!)
Symptomatic
Palpitations, dyspnea, fatigue
Chest tightness/pain, poor effort tolerance, dizziness, syncope, disordered sleep, etc
Hemodynamically unstable
• Syncope
• Symptomatic hypotension
• Acute HF, pulmonary edema
• Ongoing myocardial ischemia
• Cardiogenic shock
Hemodynamically stable
Hindricks G, et al. 2020 European Society of Cardiology (ESC) Guidelines. Eur Heart J . 2020;00:1-125.


Risk Factors for AF
Coronary Artery Disease
Vascular Disease (subclinical atherosclerosis)
Acute Illness, Surgery
Heart Failure
Valve Disease
Physical Inactivity/ Intense Activity
AGING
(borderline) Hypertension
Lipid Profile
GENETICS
AF
ETHNICITY (non-Caucasian)
(pre-) Diabetes
Alcohol Consumption
MALE SEX
Chronic Kidney Disease
Smoking
Inflammatory Diseases
COPD
Obstructive Sleep Disorder
Obesity
COPD = Chronic Obstructive Pulmonary Disorder.
Hindricks G, et al. 2020 ESC Guidelines. Eur Heart J. 2020;00:1-125.

Maintaining Normal Sinus Rhythm (NSR) May Slow Down AF Disease Progression



Wyse G, Gersh BJ. *Circulation.* 2004;109:3089-3095.

AF Related Outcomes

AF Related Outcome	Frequency in AF	Mechanism(s)
Death	1.5- to 3.5-fold increase	Excess mortality related to: • HF, comorbidities • Stroke
Stroke	20-30% of all ischemic strokes, 10% of cryptogenic strokes	• Cardioembolic or • Related to comorbid vascular atheroma
LV dysfunction/ heart failure	In 20-30% of patients with AF	• Excessive ventricular rate • Irregular ventricular contractions • A primary underlying cause of AF
Cognitive decline/ vascular dementia	Hazard ratio 1.4/1.6 (irrespective of stroke history)	• Brain white matter lesions, inflammation • Hypoperfusion • Microembolism
Depression	Depression in 16-20% (even suicidal ideation)	• Severe symptoms and decreased QoL • Drug side effects
Impaired quality of life	>60% of patients	• Related to AF burden, comorbidities, psychological functioning, and medication • Distressed personality type
Hospitalizations	10-40% annual hospitalization rate	• AF management, related to HF, MI, or AF related symptoms • Treatment-associated complications

LV = left ventricular; QoL = quality of life; MI = myocardial infraction.

Hindricks G, et al. 2020 ESC Guidelines. *Eur Heart J.* 2020;00:1-125.

AF Clinical Evaluation: Etiologic Assessment

Treatment of AF dependent on

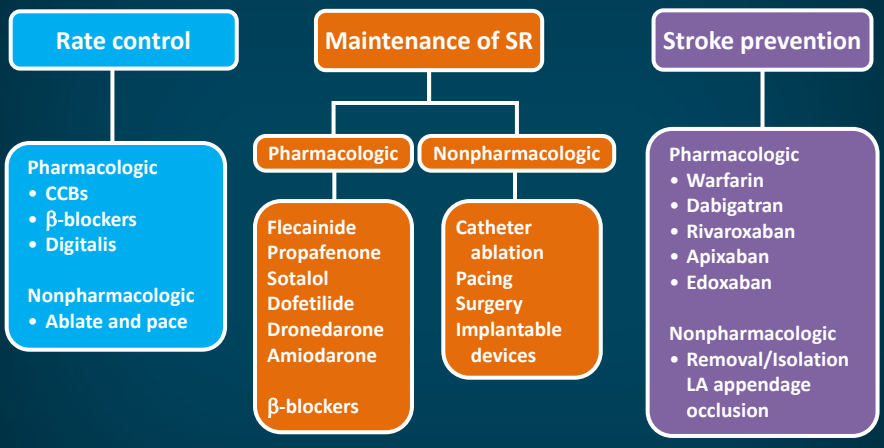
- **Etiologic** factors
  cause, severity, reversible/modifiable
- **Patient** factors
  embolic risk, concomitant disorders

- An *etiologic* assessment is **appropriate for all patients with AF**; *at a minimum*, this evaluation requires:
  - History (including family history and CHA_2DS_2-VASc)
  - Physical examination
  - Serum chemistries, complete blood count (CBC), TSH
  - Electrocardiogram (ECG)
  - Echocardiogram
  - Stress testing (if CAD is reasonably suspect from the above)
  - Chest x-ray (if pulmonary disease is suspect and/or HF is a consideration)

TSH = thyroid-stimulating hormone; CAD = coronary artery disease.

American College of Cardiology (ACC). 2014 ACC Guidelines. (http://eguideline.guidelinecentral.com/ i/387793-atrial-fibrillation/ 0?m4=). Accessed October 5, 2020.

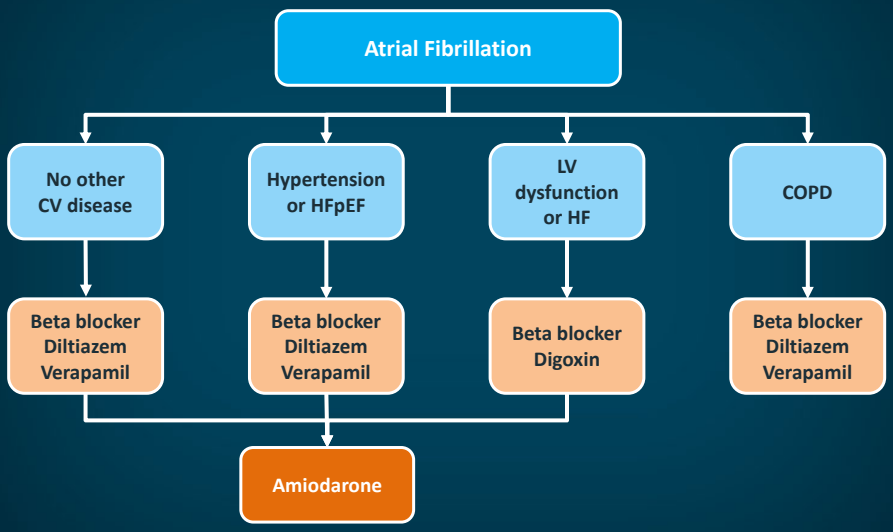
Treatment Options for AF



CCBs = Calcium channel blockers; SR = sinus rhythm; LA = left atrial.

American College of Cardiology (ACC). 2014 ACC Guidelines. (http://eguideline.guidelinecentral.com/i/387793-atrial-fibrillation/0?m4=). Accessed October 5, 2020. January C, et al. *JACC.* 2019;74:104-132.

AHA/ACC/HRS: AF Rate Control



AHA = American Heart Association; HRS = Heart Rhythm Society; CV = cardiovascular.

American College of Cardiology (ACC). 2014 ACC Guidelines. (http://eguideline.guidelinecentral.com/i/387793-atrial-fibrillation/13?m4=). Accessed October 5, 2020. January C, et al. *J Am Coll Cardiol.* 2014;64(21):e1-e76.

Trials of Rhythm and Rate Control in AF AFFIRM, RACE, AF-CHF, PIAF, STAF, HOT CAFE

Major overall findings

- Rhythm control was **NOT** superior to rate control in terms of morbidity/mortality
- *Rate* control is an acceptable primary therapeutic option
- Patients with AF and risk factors for stroke should receive anticoagulation indefinitely, even when SR appears to be restored and maintained

Both strategies are acceptable *but*…

Rate control does not apply to all patients with AF

- Particularly those symptomatic despite rate control
- Patients in whom exercise tolerance is important
- Patients in whom rate control failed
- Some patients with depressed LV function

Clinicians should adapt the therapeutic strategy to the individual

AFFIRM = AF Follow-up Investigation of Rhythm Management; RACE = RAte Control vs Electrical cardioversion for persistent AF; AF-CHF = AF and Congestive Heart Failure trial; PIAF = Pharmacological Intervention in AF; STAF = Strategies of Treatment of AF; HOT CAFE = How to Treat Chronic AF Polish trial.

Hohnloser S, et al. *Lancet*. 2000;356:1789-1794. Wyse D, et al. *N Engl J Med*. 2002;347(23):1825-1833. Van Gelder I, et al. *N Engl J Med*. 2002;347(23):1834-1840. Opolski G, et al. *Chest*. 2004;126:476-486. Vora A, et al. *J Cardiovasc Pharmacol Ther*. 2004;9(2):65-73. Ogawa S, et al. *Circ J*. 2009;73(2):242-248. Carlsson J, et al. *J Am Coll Cardiol*. 2003;41(10):1690-1696. Roy D, et al. *N Engl J Med*. 2008;358(25):2667-2677. Reiffel, J. *J Atr Fibrillation*. 2008;1:40-52.

Rate vs Rhythm Control Studies: Other Findings

Study	Findings
J-RHYTHM*	Rhythm control improved primary endpoint (P = .0128)
SAFE-T	• Maximal exercise duration better in SR group at 8 wks (P = .01) and 1 y (P = .02) • QoL more likely to improve in symptomatic patients
STAF	Remaining in AF had higher risk for embolic events (pNS Rate vs Rhythm)
PIAF	Exercise tolerance better in NSR group
Gillinov A, et al	No difference in outcomes after cardiac surgery
ORBIT-AF	• No difference in outcomes • Rhythm control was associated with more CV hospitalizations hazard ratio = 1.24 (1.10-1.39), P = .0003
RACE	In sinus rhythm, LV function significantly improved (P < .05)

*J-RHYTHM (Japanese Rhythm Management Trial for AF) studied composite of total mortality, symptomatic cerebral infarction, systemic embolism, major bleeding, hospitalization for heart failure, or physical/psychological disability requiring alteration of treatment strategy.

SAFE-T = Sotalol Amiodarone Atrial Fibrillation Efficacy Trial; ORBIT-AF = Outcomes Registry for Better Informed Treatment of AF; pNS = P non-significant.

Ogawa S, et al. *Circ J.* 2009;73:242-248. Singh S, et al. *J Am Coll Cardiol.* 2006;48:721-730. Hagens V, et al. *Heart Rhythm.* 2005;2:19-24. Carlsson J, et al. *J Am Coll Cardiol.* 2003;41:1690-1696. Gillinov A, et al. *N Engl J Med.* 2016;374:1911-1921. Noheria A, et al. *J Am Coll Card: Clin Electrophysiol.* 2016;2:221-229. Hohnsloser S, et al. *Lancet.* 2000;356:1789-1794.

Case Study 1

- A 68-y-old male has a 1-y history of paroxysmal AF lasting from 2-6 hours
- He has symptomatic palpitations and is managed with metoprolol succinate 100 mg once daily
- His ventricular rate during paroxysmal atrial fibrillation (PAF) on metoprolol is 80 beats per minute (bpm)
- He has a history of hypertension and NSTEMI 3 y ago requiring placement of a drug-eluting stent to his left anterior descending artery
- Past history is negative for diabetes, stroke, or CHF
- Other medications: atorvastatin 40 mg a day, losartan 50 mg a day, and aspirin 81 mg a day

NSTEMI = non-ST segment elevation myocardial infarction ; CHF = congestive heart failure.

Case Study 1: Question 1

- Labs: TSH – normal; creatinine clearance (CrCl) – 76 ml/min
- ECG: Sinus rhythm with rate of 78 bpm; normal with QT interval corrected for heart rate (QTc) of 422 msec
- Echocardiogram: left ventricular ejection fraction (LVEF) – 60%; LV wall thickness 1.2 cm; LA diameter – 4.3 cm
- Stress nuclear study in last year: normal LVEF (60%) with no evidence of ischemia

What is the optimal heart rate control goal for this patient?

a) Resting heart rate < 90 bpm

b) Resting heart rate < 100 bpm

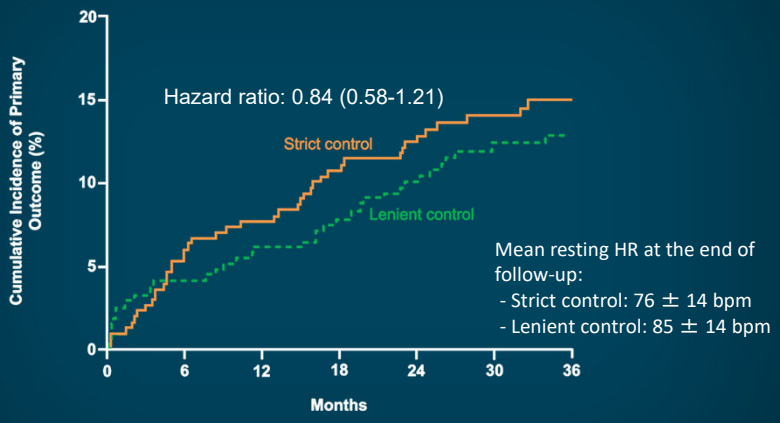
c) Resting heart rate < 120 bpm

AF: Heart Rate Goal

- Resting (apical) heart rate ≤ 80 bpm
- In RACE II [hazard ratio: 0.84 (0.58-1.21)]:
  - Strict rate control was 76 ± 14 bpm
  - Lenient rate control was 85 ± 14 bpm
- Ambulatory (Holter) heart rate ≤ 90 bpm
- Stress test: peak heart rate 20% < age-predicted maximum
- Rate to reverse tachycardia-induced cardiomyopathy not known

Wyse DG, et al. *N Engl J Med*. 2002;347(23):1825-1833. Van Gelder I, et al. *N Engl J Med*. 2010;362:1363-1373.

RACE-II: Strict vs Lenient Heart Rate (HR) Control in Patients With Permanent AF



Mean resting HR at the end of follow-up:
- Strict control: 76 ± 14 bpm
- Lenient control: 85 ± 14 bpm

Primary outcome: composite of CV death, hospitalization for HF, stroke, systemic embolism, bleeding, and life-threatening arrhythmic events

Strict control: target resting HR < 80 bpm; target exercise HR < 110 bpm

Lenient control: target resting HR < 110 bpm

Van Gelder I, et al. *N Engl J Med*. 2010;362:1363-1373.

Strict vs Lenient Rate Control of AF and HF

On day of discharge: 13,981 patients with AF and HF

- 9,100 (65.0%) had **strict** rate control
- 4,617 (33.0%) had **lenient** rate control
- 264 (1.9%) had **poor** rate control by resting HR

Lenient rate control	Adjusted risk of death	All-cause readmission	Death or all-cause readmission	Cardiovascular readmission
At 90 days (after multivariable adjustment, compared with strict rate control)	**Higher** HR = 1.21, 95% CI (1.11-1.33) *P* < .001	**Higher** HR = 1.09, 95% CI (1.03-1.15) *P* = .002	**Higher** HR = 1.11, 95% CI (1.05-1.18) *P* < .001	**Not Higher** HR = 1.08, 95% CI (1.00-1.16) *P* = .051

The presence or absence of reduced ejection fraction *did not* impact the magnitude of most observed associations

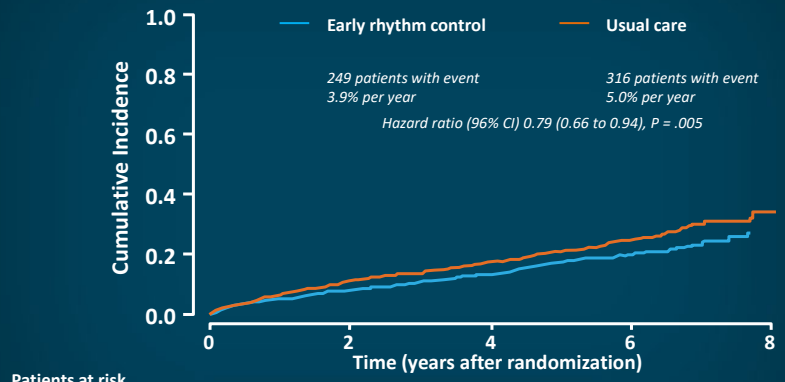
Conclusions (in patients with HF and AF)

- **2 of 3 patients** had a heart rate that met **strict** rate control goals at discharge
- Heart rates > 80 beats/min were associated with adverse outcomes *irrespective* of LVEF

Hess P, et al. *Am J Cardiol*. 2020;125:894-900.

EAST-AFNET: Primary Safety Outcome

The primary safety outcome was a composite of death, stroke, or serious adverse events related to rhythm-control therapy



Patients at risk					
Early rhythm control	1395	1193	913	404	26
Usual care	1394	1169	888	405	34

Sinus rhythm at 2 years: **82.1% in early rhythm control** vs 60.5% in usual care study arm

Kirchoff P, et al. *N Engl J Med.* 2020;383:1305-1316.

EAST-AFNET 4

	Patients With Event in Early Rhythm Control (n=1395)	Patients With Event in Usual Care (n=1394)	Uncorrected Hazard Ratio [95% CI]
Cardiovascular death	67 / 6915 (1.0)	94 / 6988 (1.3)	0.72 [0.52-0.98]
Stroke	40 / 6813 (0.6)	62 / 6856 (0.9)	0.65 [0.44-0.97]
Hospitalization with worsening of heart failure	139 / 6620 (2.1)	169 / 6558 (2.6)	0.81 [0.65-1.02]
Hospitalization with acute coronary syndrome	53 / 6762 (0.8)	65 / 6816 (1.0)	0.83 [0.58-1.19]

The primary safety outcome was a composite of death, stroke, or serious adverse events related to rhythm-control therapy.

Kirchoff P, et al. *N Engl J Med.* 2020;383:1305-1316.

EAST-AFNET 4 and AFFIRM: Differences

	AFFIRM	EAST-AFNET
Early initiation of rhythm control		X
Study centers	North America	Europe
More persistent AF	X	
Higher % hypertension, valvular heart disease		X
Dronedarone and catheter ablation use		X
High digoxin use	X	
High sotalol and amiodarone use	X	
Non-vitamin K antagonist oral anticoagulants (NOAC) use		X
Oral anticoagulant (OAC) use equivalent in 2 arms/ lower stroke rate		X
All-cause mortality primary endpoint	X	
Composite endpoint: CV death, stroke, worsening HF, acute coronary syndromes (ACS)		X
Rhythm control: Higher hospitalizations	X	
Safety outcomes no different in 2 arms of study		X
High # lost to follow-up		X

The AFFIRM Investigators. *N Engl J Med.* 2002;347:1825-1833. Kirchoff P, et al. *N Engl J Med.* 2020;383:1305-1316.

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Case Study 1: Question 2

- After 6 months, he represents with complaints of palpitations that began 1 week ago; he is still taking metoprolol succinate 100 mg daily with no missed doses as well as apixaban for 6 months.
- EKG: AF with rate of 85 bpm; QTc of 410 msec
- Echocardiogram: LVEF – 45%

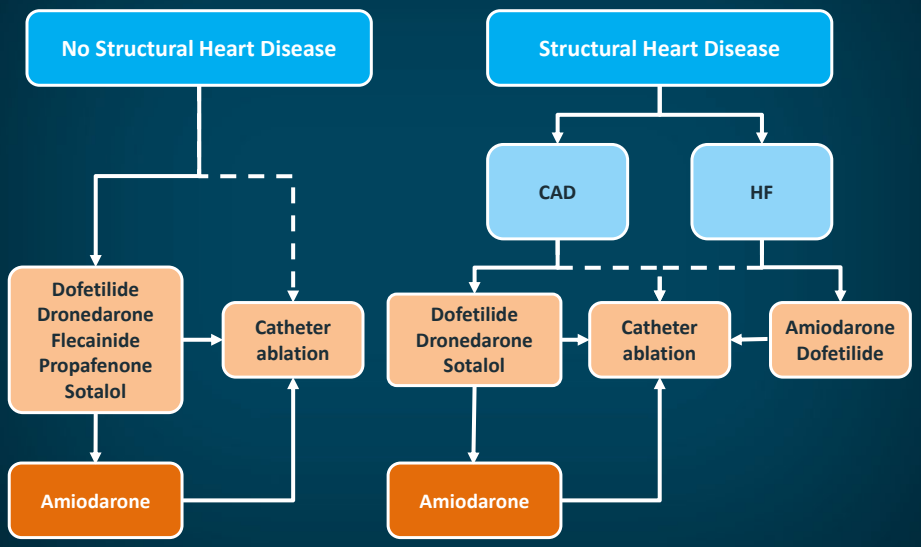
What would you change in his management?

a) Continue present treatment

b) Add dronedarone and reassess in 1 week

c) Increase metoprolol dose to 200mg/day

AHA/ACC/HRS: AF Rhythm Control



American College of Cardiology (ACC). 2014 ACC Guidelines. (http://eguideline.guidelinecentral.com/i/387793-atrial-fibrillation/17?m4=). Accessed October 5, 2020. January C, et al. *J Am Coll Cardiol*. 2014;64(21):e1-e76.

AAD Classification and Pharmacokinetics

Antiarrhythmic Class		Agent	CYP Substrate	P-gp	Enzymes/Transporters Inhibited
Class I	Class Ia	Quinidine	3A4	Yes	3A4, 2D6, P-gp
		Procainamide	No	No	None known
		Disopyramide	3A4	No	None known
	Class Ib	Lidocaine	1A2, 2B6, 2D6	No	1A2
		Mexiletine	2D6. 1A2	No	1A2
	Class Ic	Flecainide	2D6	No	2D6
		Propafenone	1A2, 2D6, 3A4	No	2D6
Class II		Propranolol	2D6, 1A2, 2C19	Yes	P-gp, weakly 2D6
		Bisoprolol	3A4 (minor: 2D6)	Possibly	None known
		Metoprolol	2D6	No	None known
		Carvedilol	2D6, 2C9 (minor: 3A4, 1A1, 1A2, 2C19, 2E1)	No	P-gp
Class III		Amiodarone	3A4, 2C8	No	1A2, 2D6, 2C9, 3A4, P-gp
		Dronedarone	3A4	No	3A4, 2d6, P-gp
		Sotalol	No	No	None known
		Ibutilide	No	No	None known
		Dofetilide	Insignificant	No	None known
Class IV		Verapamil	3A4, 3A5, 2C8 (minor: 1A2, 2C9, 2D6, 2E1)	Yes	3A4, P-gp
		Diltiazem	3A4, 2C8, 2C9, 2C19	Yes	3a4, possibly 2D6, P-gp

CYP = cytochrome P-450; P-gp = P-glycoprotein.

Konieczny K, Dorian P. *JICRM*. 2019;10(3):3552-3559.

Whiteboard Presentation

Please scan the QR code below for a brief animation exploring the mechanisms of action of antiarrhythmics indicated for rhythm control in AF

Antiarrhythmic Therapy With AADs

What is the goal?

AF is usually recurrent and rarely lethal →
Keep goals realistic

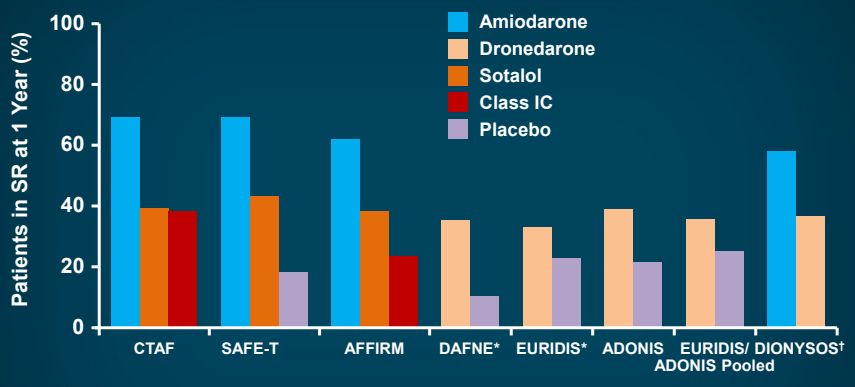
- Reduce the frequency, duration, and severity of events
- Minimize the risks of treatment (drug, ablation, etc)

- **AAD therapy** (per the AHA/ACC/HRS and ESC algorithmic guidelines) *must be selected based on:*
  - **Anticipated efficacy** (most have ~40-60% efficacy; amiodarone is a bit higher)
  - Tolerance (highest: dofetilide, dronedarone, flecainide, propafenone, sotalol)
  - **Proarrhythmic risk** (IC in SHD, TDP with QT prolonging AADs)
  - **Organ toxicity** (highest with amiodarone, PA, quinidine)
  - **Effects on SN and conduction system** (least with dofetilide)
  - **LV dysfunction** (safest with dofetilide and amiodarone)

AADs = antiarrhythmic drugs; SHD = structural heart disease; TDP = torsades de pointes; PA = procainamide; SN = sinus node.

Camm A, et al. *Eur Heart J*. 2010:31;2369-2429. Fuster V, et al. *J Am Coll Cardiol*. 2006;48:e149-e246. Naccarelli GV, et al. *Bus Brief: US Cardiol*. 2004;1-5.

Efficacy of AADs in AF Trials



*At 6 months; †Mean follow-up 7 months.
CTAF = Canadian Trial of Atrial Fibrillation; SAFE-T = Sotalol Amiodarone Atrial Fibrillation Efficacy Trial; DAFNE = Dronedarone Atrial Fibrillation Study after Electrical Cardioversion; EURIDIS = European Trial in Atrial Fibrillation or Flutter Patients Receiving Dronedarone for the Maintenance of Sinus Rhythm; ADONIS = American-Australian-African Trial with Dronedarone in Atrial Fibrillation or Flutter for the Maintenance of Sinus Rhythm; DIONYSOS = Randomized, Double-blind Trial to Evaluate the Efficacy and Safety of Dronedarone vs Amiodarone for at Least 6 Months for the Maintenance of Sinus Rhythm in Patients with AF.
Naccarelli G, et al. *Clin Med Insights Cardiol.* 2011;5:103-119. Roy D, et al. *Am J Cardiol*. 1997;80:464-468. Singh B, et al. *N Engl J Med*. 2005;352(18):1861-1872. AFFIRM Investigators. *J Am Coll Cardiol.* 2003;42:20-29. Touboul P, et al. *Eur Heart J.* 2003;24:1481-1487. Singh B, et al. *N Engl J Med*. 2007;357(10):987-999. Le Heuzey J, et al. *J Cardiovasc Electrophysiol*. 2010;21:597-605.

Propafenone vs Flecainide

	Propafenone	Flecainide
Metabolism	Hepatic (P450D6)	Hepatic – 70% Renal – 30%
Active metabolites	5-OH Propafenone	None
β-blocking activity	Yes	No
Drug interactions	Digoxin Warfarin	Amiodarone
Onset/offset kinetics	Fast/slow	Slow/slow
K-channel blocker	No	Low
Saturated pharmacokinetics	Yes	No

Lei M, et al. *Circulation*. 2018;138:1879-1896. Flecainide (Tambocor® PI). 2015 (https://davisplus.fadavis.com/3976/meddeck/pdf/flecainide.pdf). Accessed October 19, 2020.

Amiodarone: Adverse Effects

- Well tolerated hemodynamically with **minimal negative inotropic effects**
- Drug interactions: digoxin, warfarin, quinidine, procainamide, and flecainide

System	Adverse Effect
Cardiac	• Bradycardia (may require backup permanent pacing) but *low-dose amiodarone may minimize* • Prolongs action potential duration (APD); however, torsade de pointes (TdP) and development of incessant sustained ventricular tachycardia (VT) is *rare* • Raises defibrillation threshold (DFT)
Dermatologic	Skin photosensitivity Bluish-gray discoloration
Endocrine	Hypothyroidism – requires addition of thyroid replacement Hyperthyroidism – may require therapy discontinuation
Hepatic	Asymptomatic, transient ↑ of hepatic enzymes and drug-induced hepatitis (2%)
Neurologic	Peripheral neuropathy and myopathy Usually resolves with ↓ dose
Ocular	Corneal microdeposits
Pulmonary	Interstitial pneumonitis
Vascular	Venous sclerosis can be minimized if intravenous (IV) amiodarone is given via central venous line

Naccarelli G, et al. *Pharmacotherapy.* 1985;5:298-313.

Dofetilide vs Amiodarone

- Greater efficacy for termination of AF
- Similar safety in CHF and post-MI patients
- Little sinus, atrioventricular nodal (AVN), or His Purkinje System (HPS) effect
- No end-organ toxicity or added cost following thyroid, liver, lung, and eye complications
- Dofetilide **requires in-hospital initiation** due to TdP risk; rate control drug
  - TdP is of lower concern based on in-hospital telemetry, proper patient screening, dosing by creatinine clearance
- Renal clearance minimizes use in patients with chronic renal failure (CRF)
- Both have multiple pharmacokinetic drug interactions
- QT interval is a poor man's blood level

Wolbrette D, et al. *J Cardiovasc Pharm Ther.* 2019;24:3-10.

Ibutilide vs Amiodarone

- Meta-analysis (8 studies, 506 patients) of IV ibutilide and amiodarone in AF and atrial flutter (AFL)
- Enhanced **total efficacy** in cardioversion of AF and AFL; however, *no significant difference in cardioversion rate for AF*
- Cardioversion time of AF and AFL shorter than amiodarone
- No significance in total adverse reactions; however, cardiovascular adverse reaction rate of ibutilide group is significantly higher than amiodarone

Xiao D, Wenhui D. *Heart.* 2011;97:A122.

Sotalol vs Amiodarone

- Sotalol can significantly delay time to AF recurrence
- Both are equally efficacious in symptomatic and asymptomatic patients
- Both are equally efficacious in converting AF to sinus rhythm
  - Amiodarone is superior for maintaining sinus rhythm
    - **Both with similar efficacy in ischemic heart disease**
- Side effect profiles similar in follow-up (SAFE-T)
- Was associated with ↑ risk all-cause mortality when compared with no AAD (hazard ratio – 1.53, 95% CI), but **↓ risk of death when compared with amiodarone** (hazard ratio – 0.72, 95% CI)

Piccini J, et al. *Am J Cardiol.* 2014;114:716-722. Singh B, et al. *N Engl J Med.* 2005;352:1861-1872.

Clinical Profiles for Amiodarone and Dronedarone

	Amiodarone	Dronedarone
Iodine moiety	Yes	No
$T_{1/2}$	53 days	14-30 hours
Blocks I_{Kr}; I_{Ks}; B_1; I_{Ca}; I_{to}; I_{Na}	Yes	Yes
Dosing	Daily after loading	BID with meals
Food effect	Yes	Yes
CYP4503A4 metabolism	Yes	Yes
Inhibits tubular secretion of creatinine	Yes	Yes
Increase QT but low TdP	Yes	Yes
Efficacy in suppressing AF	65%	50%
Efficacy in suppressing ventricular tachyarrhythmia	Yes	Not well studied
Decreases CV hospitalization	No	Yes
Warfarin interaction	Yes	No
Pulmonary/thyroid toxicity	Yes	No
Safety concerns in CHF	SCD-HEFT NYHA III	ANDROMEDA

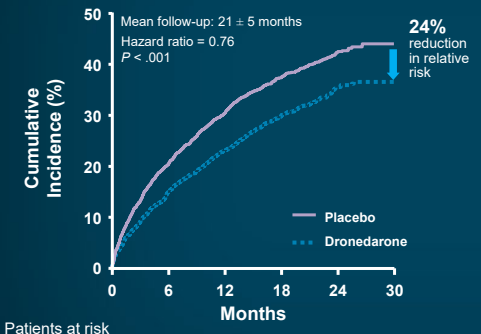
Wolbrette D, et al. *Vasc Health Risk Manage*. 2010;(6):517-523.

Dronedarone: ATHENA and PALLAS

ATHENA: PAF or Persistent AF

Primary outcome: time to first CV hospitalization or death

N = 4628 (PAF or persistent AF) randomized
≥75 y with or w/o additional RF *or* ≥70 y and ≥1 RF
(HTN, DM, prior stroke/TIA, LA diameter ≥50 mm, LVEF ≤0.40)



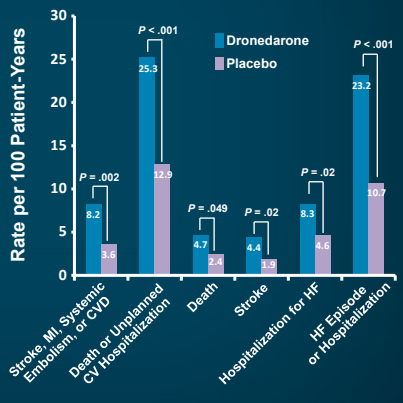
Patients at risk

Placebo	2327	1858	1625	1072	385	3
Dronedarone	2301	1963	1776	1177	403	2

PALLAS: Permanent AF

N = 3236; ≥ 65 y with > 6 mo h/o permanent AF and risk factors for major vascular event

Study stopped for safety reasons



RF = risk factor; HTN = hypertension; DM = diabetes mellitus; TIA = transient ischemic attack; h/o = history of.

Hohnloser S, et al. *N Engl J Med*. 2009;360:668-678. Connolly S, et al. *N Engl J Med*. 2011:365:2268-2676. Singh D, et al. *J Am Coll Cardiol*. 2010;55:1569-1576.

Dronedarone: Real-World Studies

Meta-analyses and recent real-world (RW) studies conducted on dronedarone

Meta-analysis	Studies Analyzed/Registries	Main Conclusion (dronedarone)
Piccini J, et al	9 RCTs (4 dronedarone, 4 amiodarone, 1 RCT for direct comparison analysis)	Fewer AEs than amiodarone; less effective at SR maintenance
Freemantle N, et al	39 RCTs (amiodarone, dronedarone, flecainide, propafenone, sotalol)	Associated w/ *lowest rate of proarrhythmia* of AADs
Dagres N, et al	7 RCTs (dronedarone)	↓ **risk of CVA or TIA** in PAF or persistent AF
Chatterjee S, et al	7 RCTs (dronedarone)	↑ **all-cause mortality** in wide population spectrum
Hohnloser S, et al	7 RCTs (dronedarone)	Permanent AF *most important predictor* of CV death w/use
Lafuente-Lafuente C, et al	59 RCTs (quinidine, disopyramide, aprindine, bidisomide, flecainide, propafenone. metoprolol, amiodarone, azimilide, dofetilide, dronedarone, sotalol)	Several class IA, IC, II, and III drugs have moderate effect on maintaining SR following conversion of AF
Diemberger I, et al	12 RCTs and 7 OBS (dronedarone)	Recurrent AF prophylaxis ***not associated*** w/↑ risk of death
Recent RW Studies	**Registries Used**	
Friberg L	Swedish patient register	Treatment for AF ***did not*** have ↑ risk of death or liver disease
Friberg L	Swedish patient register	Major bleeding rare in AF treatment w/apixaban + dronedarone
Friberg L	Swedish patient register	↓ **risk pro-arrhythmic death** vs sotalol
Grimaldi-Bensouda L, et al	PGRx surveillance system	Associated *w/class III AAD use &* onset of acute liver injury
Ehrlich J, et al	German IQVIA database	↓ **risk of MI & CVA** vs other AADs; no toxic liver disease reported
Mochalina N, et al	Swedish national quality registry (AuriculA)	↓ dose of dabigatran + dronedarone ***did not*** ↑ plasma dabigatran concentration

AEs= adverse events; OBS = observational study; ACT = randomized controlled trial.
Boriani G, et al. *Europace.* 2019;21:1764-1775 .

US Department of Defense (DOD) Real-World Outcomes: Dronedarone vs Other Antiarrhythmic Drugs

Outcomes	Dronedarone (N=6349)		Other AAD (N=12,698)		Hazard Ratio (Dronedarone/Other)
	N (%)	Event	N (%)	Event	Hazard Ratio (95% CI)
Cardiovascular hospitalization	586 (9.23%)	149.48	1315 (10.36%)	173.57	0.87 (0.79, 0.96) *P* = .006
Cardiovascular hospitalization/death from any cause	598 (9.42)	151.32	1364 (10.74%)	178.60	0.86 (0.78, 0.95) *P* = .002

Goehring EL, et al. *Am J Cardiol.* 2020;00:1-7.

Other AAD Real-World Data

- ORBIT-AF and AF: Focus on Effective Clinical Treatment Strategies (AFFECTS) registry demonstrated amiodarone was often used even when more front-line guideline-recommended drugs were available
- The Retrospective Evaluation and Assessment of Therapies in AF (TREAT-AF) study demonstrated that class IC AADs (flecainide or propafenone) as initial treatment for AF were associated with lower risk of hospitalization and cardiovascular events than class III drugs (sotalol or dofetilide)

Reiffel J, et al. *Am J Cardiol* .2010;105:1122-1129. Pokorney S, et al. *Am Heart J.* 2020;220:145-154. Kipp R, et al. *J Am Coll Cardiol : Clin Electrophysiol.* 2019;5:231-241.

Considerations in Choosing an Antiarrhythmic Drug

- Efficacy
- Safety (end-organ toxicity, mortality, proarrhythmic risk)
- Morbidity (bradyarrhythmias, negative inotropy, subjective toxicity)
- Quality of life
- Dosing convenience (patient compliance)
- Outpatient initiation
- Interactions (drug-drug, drug-device)
- Metabolism
- Cost (drug, follow-up)

Naccarelli G, et al. *Bus Briefing: US Cardiol.* 2004;1-5. Zimetbaum P. *Circulation.* 2012;125;381-389.

All Antiarrhythmics Are Not Alike

- Binding characteristics
  - Onset-offset kinetics
  - Open or inactivated state blockade
- Additional channel or autonomic blocking properties
- Proarrhythmic incidence
- Inotropic actions
- Organ toxicity and nuisance symptoms
- Drug interactions
- Metabolism
  - Active metabolites with a different mechanism of action

Lei M, et al. *Circulation,* 2018;138:1879-1896.

Whiteboard Presentation

Please scan the QR code below for a brief animation investigating the pathophysiologic consequences of interactions between selected antiarrhythmics and other cardiovascular agents

Significant AADs and Their CV Drug Interactions

Amiodarone	Dronedarone	Quinidine	Verapamil
↑ International Normalized Ratio (INR) (warfarin) ↑ digoxin level ↑ therapeutic levels: • quinidine • procainamide • flecainide Theoretic increase in DOAC levels Increase in simvastatin levels	↑ digoxin level Theoretic increase in DOAC levels Increase simvastatin levels	↑ digoxin level	Can ↑ therapeutic levels of dofetilide

DOAC = direct oral anticoagulant.

Package inserts for amiodarone, dronedarone, quinidine, and verapamil. Konieczny K, Dorian P. *J Innov Cardiac Rhythm Manage.* 2019;10(3):3552-3559. Wiggins B, et al. *Circulation.* 2016;e468-e495. Frommeyer G, et al. *Int J Cardiol.* 2017;22:74-79.

Outpatient vs Inpatient Initiation of Antiarrhythmics for AF

	In AF		In NSR	
	Hospital	Outpatient	Hospital	Outpatient
Class IA*	X		X	
Class IC*		X†		X†
Sotalol	X		X	X‡
Dofetilide	X		X	
Dronedarone		X		X
Amiodarone		X		X

*After rate control; †No SHD or sinus node/conduction abnormalities; ‡No risk factors for TdP (QT <450 ms, normal electrolytes).
SHD = structural heart disease; TdP = Torsade de pointes.

Fuster V, et al. *Circulation*. 2006;114:e257-e354.

AADs: Follow-Up Protocols

Proarrhythmias

- May occur ***late***
  - Risk factors develop
  - Drug clearance impaired
- Organ toxicity is ongoing risk with amiodarone
- Permanent AF – discontinue membrane active AADs

Class IC
Flecainide, Propafenone

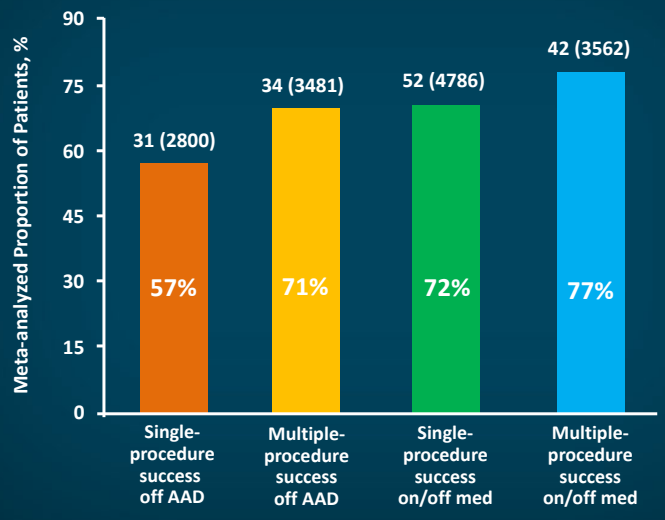
- Coronary artery disease, ventricular disorders
  - ECG, exercise test

Class III
Dofetilide, Sotalol
Dronedarone
Amiodarone

- QT interval
- Renal function/chemistry profiles
- ECG if long-lasting and persistent AF suspected
- LFTs and TSH every 6 months, chest x-rays annually, PFTs (if pulmonary toxicity suspected)

Dan G, et al. *Europace.* 2018;20:731-732. January C, et al. *J Am Coll Cardiol.* 2014;64:e1-e76.

Efficacy of Catheter Ablation in Patients With AF



Calkins H, et al. *Circ Arrhythmia Electrophysiol*. 2009;2(4):349-361.

CASTLE-AF:

Catheter Ablation vs Conventional Drug Therapy for AF in HF

397 patients w/LVEF < 35% and ICD randomized to CA vs drug therapy Modified ITT approach

Symptomatic PAF (30%) Persistent AF (35%)

- Primary endpoint: TM + HF hospitalization ***reduced by CA*** (28.5% vs 44.6%, RRR 38%, *P* = .007) with mean follow-up of 37 mo
- Secondary endpoints: TM (13.4% vs 25%, RRR 47%), HF hospitalization (20.7% vs 35.9%, RRR 44%), CV mortality (RRR 51%) and CV hospitalization (RRR 28%)
- *LVEF increased more with ablation* (8%) than drugs (0.2%, *P* = .005)
- AF *reduced with ablation at 3 mo*; gradually increased over 60 mo of follow-up

ICD = implantable cardioverter-defibrillator; CA = catheter ablation; TM = total mortality; RRR = relative risk reduction.

Marrouche N, et al. *NEJM*. 2018;378:417-427. European Society of Cardiology. EHRA 2018 Congress News. (https://www.escardio.org). Accessed October 21, 2020. Stiles S. Mortality falls after AF ablation in heart failure: CASTLE-AF in print. 2018 (https://www.medscape.com/viewarticle/892189). Accessed October 21, 2020.

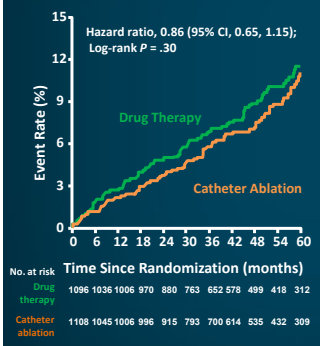
Catheter Ablation in HF

Recommendation for Catheter Ablation in HF		
COR	**LOE**	**Recommendation**
IIb	B-R	**AF catheter ablation may be reasonable in selected patients with symptomatic AF and HF w/reduced LVEF (HFrEF) to potentially lower mortality rate and reduce hospitalization for HF** **NEW:** New evidence, including data on improved mortality rate, has been published for AF catheter ablation compared with medical therapy in patients with HF

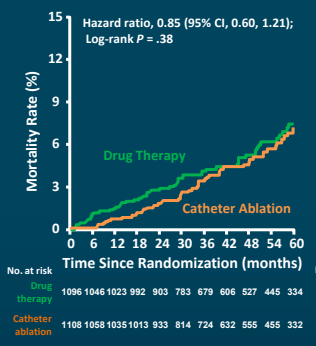
January C, et al. 2019 AHA/ACC/HRS Guidelines. *Circulation*, 2019;74(1):104-132.

CABANA: Catheter Ablation vs Drug Therapy (ITT)

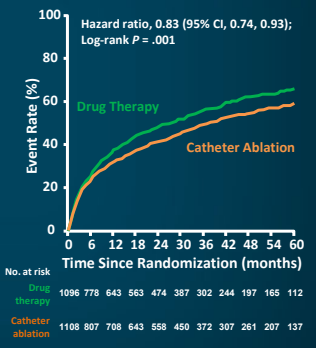
Primary endpoint (death, disabling stroke, serious bleeding, cardiac arrest)



All-cause mortality



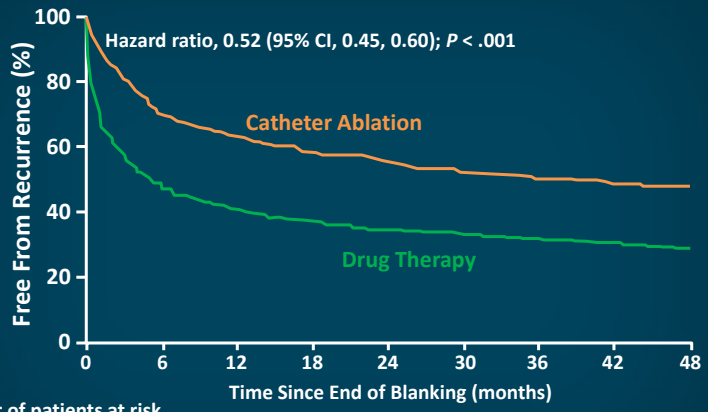
Mortality or CV hospitalization



CABANA = The Catheter Ablation vs Antiarrhythmic Drug Therapy for Atrial Fibrillation trial.
Packer D, et al. *JAMA*. 2019;321(13):1261-1274.

CABANA: Recurrent AF

ITT After Blanking Period



Number of patients at risk

Drug therapy	629	304	252	212	181	157	131	115	94
Catheter ablation	611	432	381	328	291	241	201	163	134

Packer D, et al. *JAMA*. 2019;321(13):1261-1274.

CABANA Trial: Conclusion

- Ablation compared to drug therapy (ITT):
  - **Did not** produce a significant reduction in the primary endpoint and all-cause mortality
  - **Ablation significantly reduced mortality or cardiovascular hospitalization by 17%**
  - There was a **48% reduction in recurrent AF** with ablation
- Ablation compared to drug therapy (treatment received)
  - 14% reduction in primary endpoint and 17% reduction in mortality or CV hospitalization

Ablation is an acceptable treatment strategy for the treatment of AF with low adverse event rates

Packer D, et al. *JAMA*. 2019;321(13):1261-1274.

Case Study 2

- A 58-y-old man presents to you after moving to the area
- He complains of dyspnea on exertion and fatigue
- He has a 5-y history of paroxysmal AF with a rate on Holter monitor ranging from 70-120 bpm (average 98 bpm)
- He had a failed catheter ablation procedure for his AF 1 y ago and was treated with sotalol prior to his ablation without control of his AF recurrences
- Additional medical history includes 10-y history of treated hypertension with 1 hospital admission 2 y ago for HFpEF; his history is negative for diabetes, coronary artery disease, and stroke

Case Study 2: Question 1

- Current medications include diltiazem controlled delivery (CD) 120 mg a day and rivaroxaban 20 mg a day with the evening meal
- EKG: AF rate of 120 bpm; QTc 430 msec; no other abnormalities
- Stress nuclear study 1 y ago: normal perfusion, no ischemia or infarction with LVEF 60%
- Echocardiogram: LVEF 55% (diffuse mild hypokinesis); mildly dilated LA (4.8 cm)

In addition to increasing his diltiazem dosage for better rate control during AF episodes, what recommendations do you have for this patient?

a) Add an AAD that could be safely initiated as an outpatient such as flecainide, propafenone, or dronedarone

b) Reattempt catheter ablation

c) Add amiodarone

Atrial Fibrillation and Stroke

Stroke is the most common complication of AF

Incidence of all-cause CVA in AF[1]	Number of CVAs caused by AF	Ischemic CVAs in NVAF	Ischemic CVA risk (elderly > 75 y, uncoagulated AF)	Annualized CVA rates for PAF & persistent AF
5%	1 in 7	90%	5.49 ↑ risk vs < 65 y old	PAF = 3.2% Persistent AF = 3.3%

- Ischemic stroke associated with AF is often *more severe* than stroke from other etiology
- Stroke risk persists even in asymptomatic AF
- In patients with AF <70 y old: 187% greater risk of dementia and 130% increased risk for Alzheimer's

Fuster V, et al. *J Am Coll Cardiol.* 2001;38:1231-1265. Benjamin E, et al. *Circulation*. 1998;98:946-952. Friberg L, et al. *Eur Heart J.* 2012;33:1500-1510. Dulli D, et al. *Neuroepidemiology*. 2003;22:118-123. Page R, et al. *Circulation*. 2003;107:1141-1145. Bunch TJ, et al. *Heart Rhythm*. 2010;7:433-437. Bunch TJ, et al. Heart Rhythm Society. 2009, Boston, MA. BBC News. Heart disorder Alzheimer's link. 2009 (http://news.bbc.co.uk/2/hi/health/8051800.stm). Accessed October 21, 2020. CDC. What is atrial fibrillation? 2020 (https://www.cdc.gov/heartdisease/atrial_fibrillation.htm). Accessed October 21, 2020.

Assessing and Balancing Stroke Risk

CHA_2DS_2-VASc Score

Risk Factor	Score
Congestive heart failure/ LV dysfunction	1
Hypertension	1
Age ≥ 75 y	2
Diabetes	1
Stroke/TIA/TE history	2
Vascular disease	1
Age 65-74 y	1
Sex **c**ategory, female	1
MAXIMUM	9

Adjusted Risk

Total Score	CHA_2DS_2-VASc (%/y)
0	0
1	1.3
2	2.2
3	3.2
4	4.0
5	6.7
6	9.8
7	9.6
8	6.7
9	15.2

LV = left ventricle; TE = thromboembolism; TIA = transient ischemic attack.

1. Lip G, et al. *Chest*. 2010;137:263-272. European Society of Cardiology. *Europace*. 2010;12:1360-1420.

Anticoagulant, Antiplatelet, or Neither: Current Guidelines

Risk Factor	Recommended Therapy	
	ESC	AHA/ACC/HRS
No risk factors CHA_2DS_2-VASc = 0 in men CHA_2DS_2-VASc = 1 in women	Prefer neither, or OAC vs antiplatelet (consider bleeding complications and patient preferences)	Neither
CHA_2DS_2-VASc = 1 in men CHA_2DS_2-VASc = 2 in women	Prefer OAC, or ASA 75-325 mg daily	Neither or ASA or OAC
CHA_2DS_2-VASc ≥2 in men CHA_2DS_2-VASc ≥3 in women	TSOAC* > VKA	TSOAC* or VKA
Mechanical valve (modern)	VKA: INR 2.0-3.0 (AVR) VKA: INR 2.5-3.5 (MVR)	

ASA = acetylsalicylic acid; TSOAC = target-specific oral anticoagulants; VKA = vitamin K antagonists; AVR = aortic valve replacement; MVR = mitral valve replacement.

Camm A, et al. 2012 ESC Guidelines. *Eur Heart J*. 2012;33:2719-2747. January C, et al. *J Am Coll Cardiol*. 2014;64(21):e1-e76. January C, et al. AHA/ACC/HRS Guidelines. *Circulation*. 2019;74(1):104-132. ACC. 2017 AHA/ACC Focused Update. *J Am Coll Cardiol*. 2017;70:252-289.

How Lifestyle Affects AF

Smoking	Quitting *decreased AF by 36%*
Alcohol	10% ↑ **risk** with 1 drink/day
Impact of comorbidities on AF	• OSA treatment can *reduce* AF • HTN control can *reduce* AF • DM ↑ **risk** of AF • Obesity ↑ **risk** of *new onset* AF by 40%; **weight loss** *reduces* AF burden and recurrences
Lifestyle choices can affect AF	• Stimulants (caffeine, adrenergic drugs) • Mediterranean diet may *reduce* AF • Mindset and stress (yoga *reduced* AF by 24%) • Physical activity *reduces* AF

Subzwari S, et al. *Cureus.* 2018;10(5):e2682. Foy A, et al. *Am J Cardiol.* 2018;121:1072-1075. Pathak P, et al. *J Am Coll Cardiol.* 2015;65:2159-2169.

AF: Risk Factor Management & Lifestyle Modification

Aggressive Risk Factor Management

Weight Management and Exercise	Hyperlipidemia	Obstructive Sleep Apnea	Hypertension	Diabetes
• Education • Diet plan • Initial target: >10% wt loss • Final target: BMI <27 kg/m^2 • Avoid weight fluctuation • Exercise: 30 min, 3-4x/wk ↑ up to 250 min/wk	• Initial lifestyle measures • At 3 mo: – Start statins if LDL >100 mg/dl • Add fibrates if TG >230 mg/dl • Start fibrates if TG >500 mg/dl	• Overnight sleep study • CPAP if AHI ≥30; or ≥20/h with resistant HTN or daytime somnolence • Check adherence: regular CPAP machine data download	• Home BP diary: 2- 3x daily • Reduce salt • Start ACEI or ARB • BP target (mmHg) **rest:** *<130/80* **peak exercise:** *<200/100*	• Glucose tolerance test • Lifestyle measures • At 3 mo: – Metformin if HbA1c >6.5% • Diabetes clinic or endocrine review

Smoking cessation & alcohol abstinence (or reduction to 30 g per week)

BMI = body mass index; LDL = low-density lipoprotein; TG = triglycerides; CPAP = continuous positive airway pressure; AHI = apnea-hypopnea index; HTN = hypertension; BP = blood pressure; ACEI = angiotensin-converting enzyme inhibitor; ARB = angiotensin II receptor blocker; HbA1c = hemoglobin A1c.

Chung M, et al. *J Am Coll Cardiol.* 2020;75(14):1689-1713.

Shared Decision-Making (SDM) in AF

While SDM in AF frequently centers around anticoagulation, it is reasonable to apply SDM to all aspects of AF management:

Remind why treatment is important

Ensure original treatment decisions are still appropriate to current patient situation and priorities

Identify adherence factors
Accessibility (cost barriers, delayed prescription fill)
Organization (fixed packaging, pill boxes)
Administration (reminders)

- Ongoing process that starts during initial treatment discussion
- Evolves over time as a series of "problem-solving" discussions that refine individualized care plans to live well with treatment
- Can uncover which aspects of an individual situation need intervention *as well as* the situation-specific action required

Brand-McCarthy S, et al. *Circ Cardiovasc Qual Outcomes.* 2020;13:e006080.

Goals of SDM

- To help patients and clinicians make shared and informed decisions that integrate:
  - Known risks and benefits of treatment
  - Pertinent patient-specific situations
  - Patient preferences

What SDM does → **Enhances communication**
Facilitates identification of individualized treatment options

What SDM is *not* → **A checklist of tasks to be completed**

Noseworthy P, et al. *J Interv Card Electrophysiol.* 2019;56:159-163.

Integrated AF Management

INTEGRATED AF MANAGEMENT

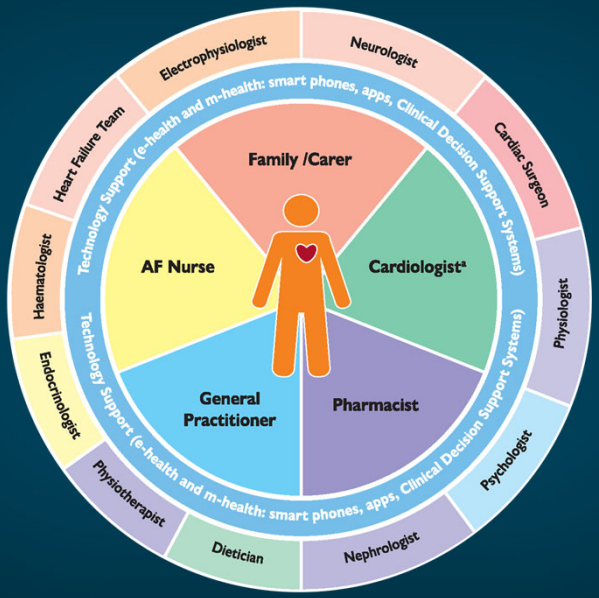
Patient-centered

- Optimized stroke prevention
- Symptom control with rate or rhythm control
- Management of cardiovascular risk factors/comorbidities
- **Patient education/self-management** (including personal goals and/or action plan, exacerbation management)
- **Healthcare professional education**
- **Lifestyle modification** (ie, smoking cessation, dietary intervention to lose weight, exercise)
- **Psychosocial management** (cognitive behavioral therapy, stress management, other psychological assessment and/or treatment)
- Strategies to promote medication adherence
- **Multidisciplinary team approach** Active participation and formation of teams of HCPs from different disciplines; integration of services, MDT meeting (as needed)
- Structured follow-up and clear communication between primary and secondary care

HCPs = healthcare professionals; MDT = multidisciplinary team.

Hindricks G, et al. 2020 ESC Guidelines. *Eur Heart J.* 2020;00:1-125.

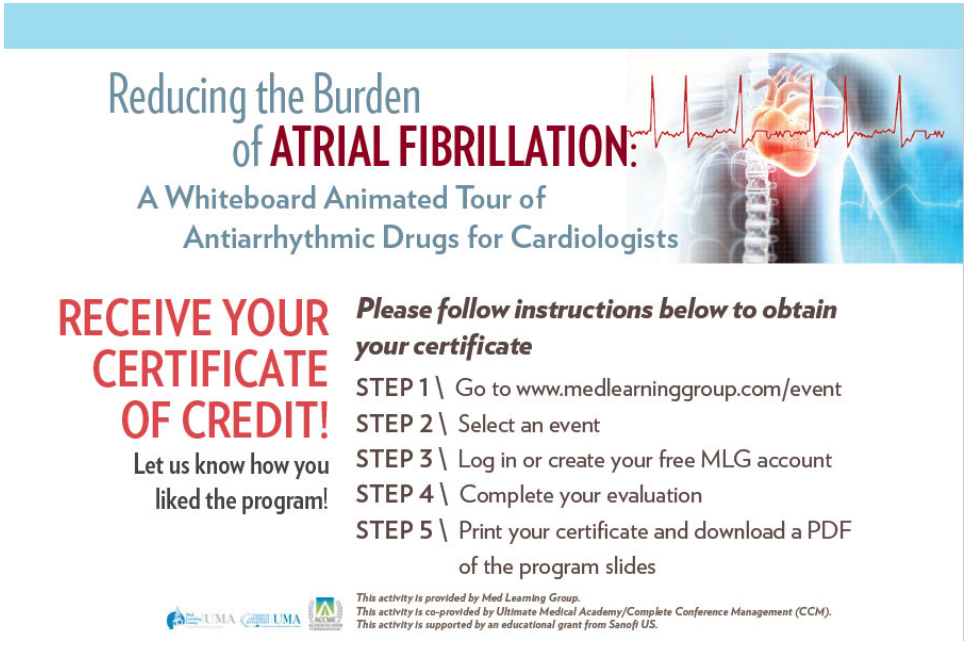
Integrated AF Management Team



Hindricks G, et al. 2020 ESC Guidelines. *Eur Heart J.* 2020;00:1-125.

"ATRIAL FIBRILLATION IS THE GIFT THAT KEEPS ON GIVING"

- AF is chronic so you will get to be good friends with your long-term patients
- Keep goals realistic; total prevention with AADs is unlikely in the absence of a correctable underlying disorder
- AAD therapy selection should be based on anticipated efficacy, proarrhythmic risk, organ toxicity, and effects on nodal, conductive system, and LV function
  - AF can be refractory to amiodarone, which can also have significant long-term toxicity
- No new antiarrhythmic agents near FDA approval in near future
- Catheter ablation can be effective and is growing but still has limitations
- Rate control has similar long-term efficacy on mortality
- Lifestyle modifications may be part of the treatment approach for patients with AF but will not be a panacea
- If you remember nothing else, remember this: "Protect the brain" with proper antiembolic strategies in high-risk patients with AF



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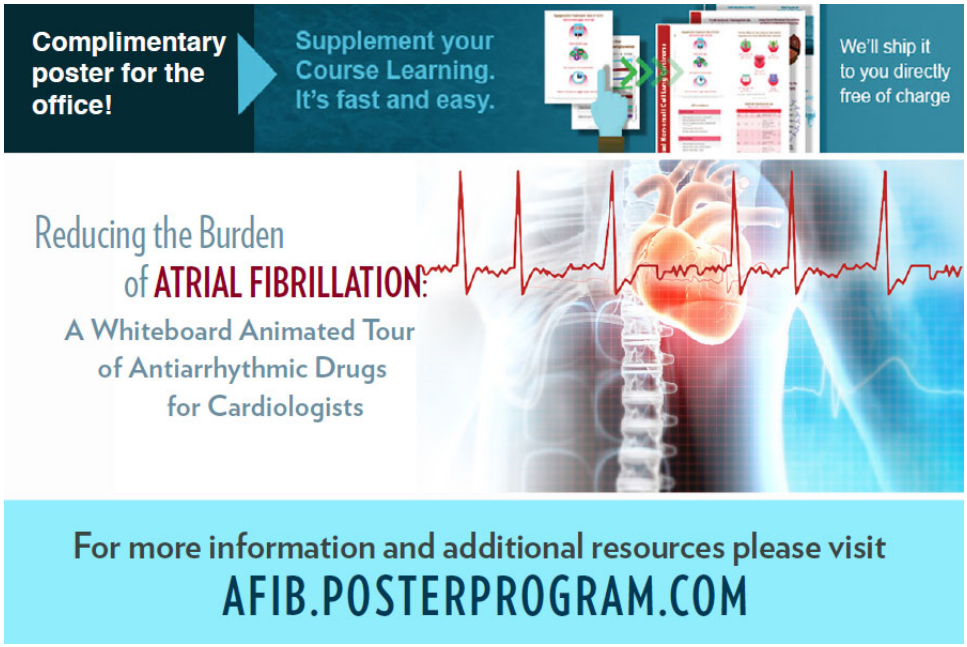
Complimentary poster for the office!
Supplement your Course Learning. It's fast and easy.
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Reducing the Burden of ATRIAL FIBRILLATION:
A Whiteboard Animated Tour of Antiarrhythmic Drugs for Cardiologists
For more information and additional resources please visit
AFIB.POSTERPROGRAM.COM

Thank you!

Overview of Atrial Fibrillation and Guidelines

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Shared Decision-Making and Interdisciplinary Care

Resource	Address
Brand-McCarthy SR, et al. Can shared decision making improve stroke prevention in atrial fibrillation?: Implications of the updated guidelines. *Circ Cardiovasc Qual Outcomes.* 2020;13:e006080.	https://www.ahajournals.org/doi/10.1161/CIRCOUTCOMES.119.006080
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