Atrial Fibrillation: When to Refer for Ablation and LAA Closure

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Rutgers – Robert Wood Johnson Medical School

June 24, 2023

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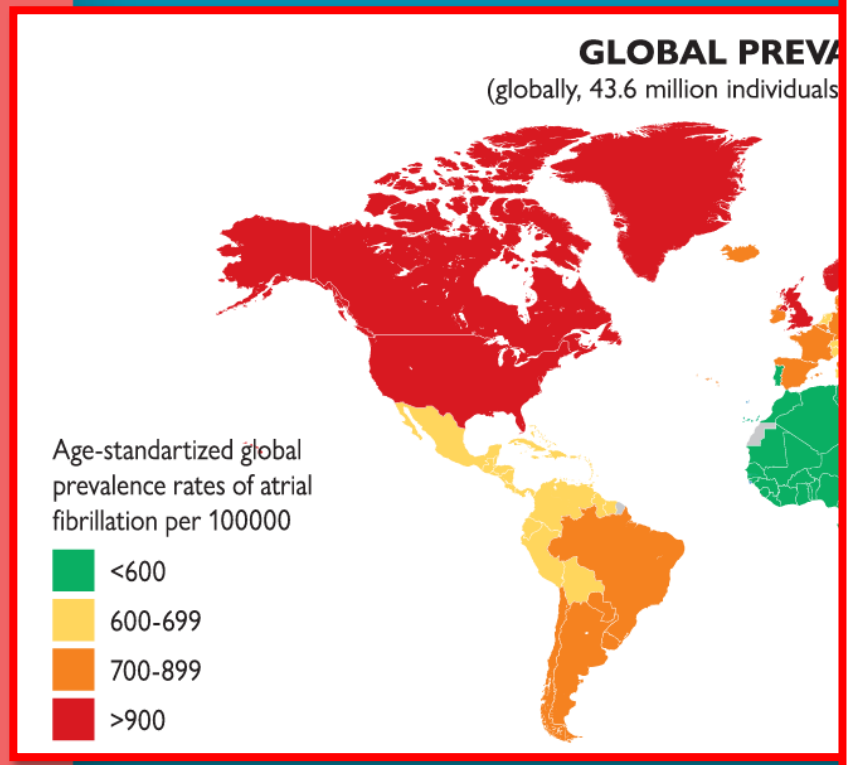
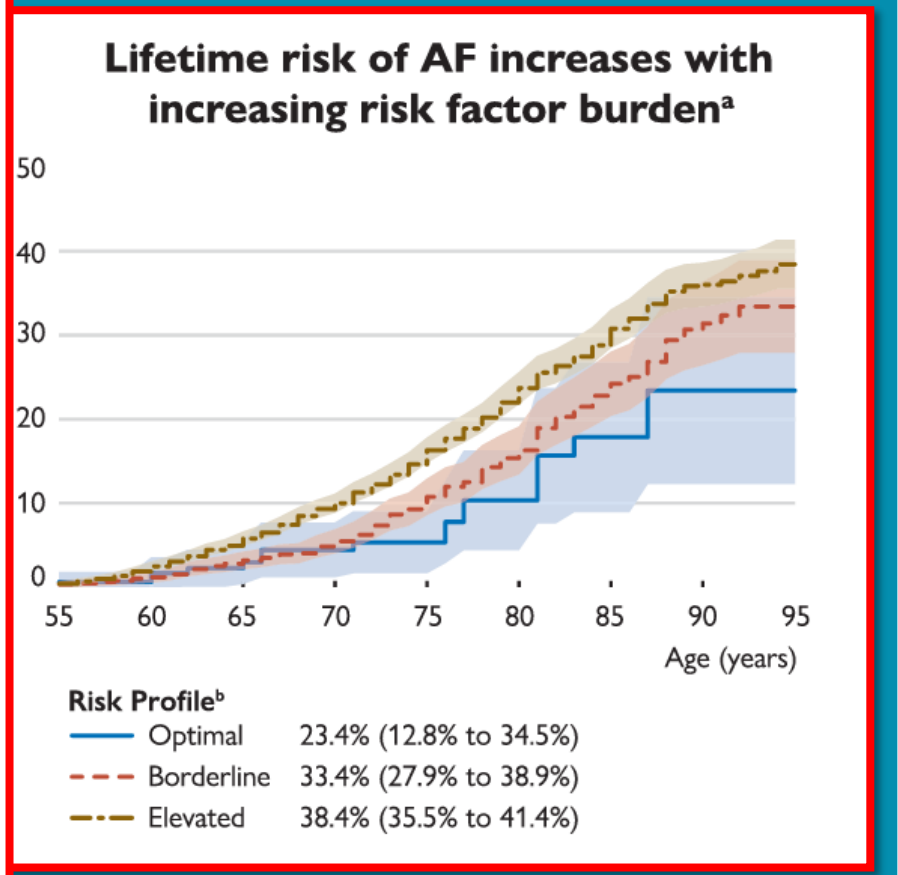
AF - Most Common Sustained Arrhythmia





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ESC Guidelines, 2020

American Heart Association.

AFib Symptom Tracker

StopAfib.org

Atrial fibrillation (AFib) may have no symptoms, or symptoms may worsen over time.

Date Symptoms Checked	Next Checkup Date (6 mos)

Unusual Heartbeats

1 Do you have pounding or racing heartbeats?
◯ never ◯ occasionally ◯ often ◯ always

2 Does physical activity lead to unusual heart rhythms?
◯ never ◯ occasionally ◯ often ◯ always

3 Do you have unusual or uncomfortable heartbeats or palpitations?
◯ never ◯ occasionally ◯ often ◯ always

4 Do you feel anxious with racing heartbeats or palpitations?
◯ never ◯ occasionally ◯ often ◯ always

Short of Breath

1 Are you short of breath during normal activities?
◯ never ◯ occasionally ◯ often ◯ always

2 Are you short of breath when lying down?
◯ never ◯ occasionally ◯ often ◯ always

3 Are you more easily tired than you used to be?
◯ never ◯ occasionally ◯ often ◯ always

Lightheaded

1 Are you concerned that you may pass out or faint?
◯ never ◯ occasionally ◯ often ◯ always

2 Do you feel dizzy?
◯ never ◯ occasionally ◯ often ◯ always

3 Do you feel lightheaded when you get up?
◯ never ◯ occasionally ◯ often ◯ always

Symptoms aren't the only important clue for evaluating and managing AFib. But it's still important to discuss any changes in symptoms with your health care professional.

If you answered "occasionally" or "often" to any of the above questions, how frequently do you experience this?

◯ daily ◯ probably every month
◯ probably every week ◯ once or twice a year

Write in: What specific activities cause you to feel winded or short of breath?

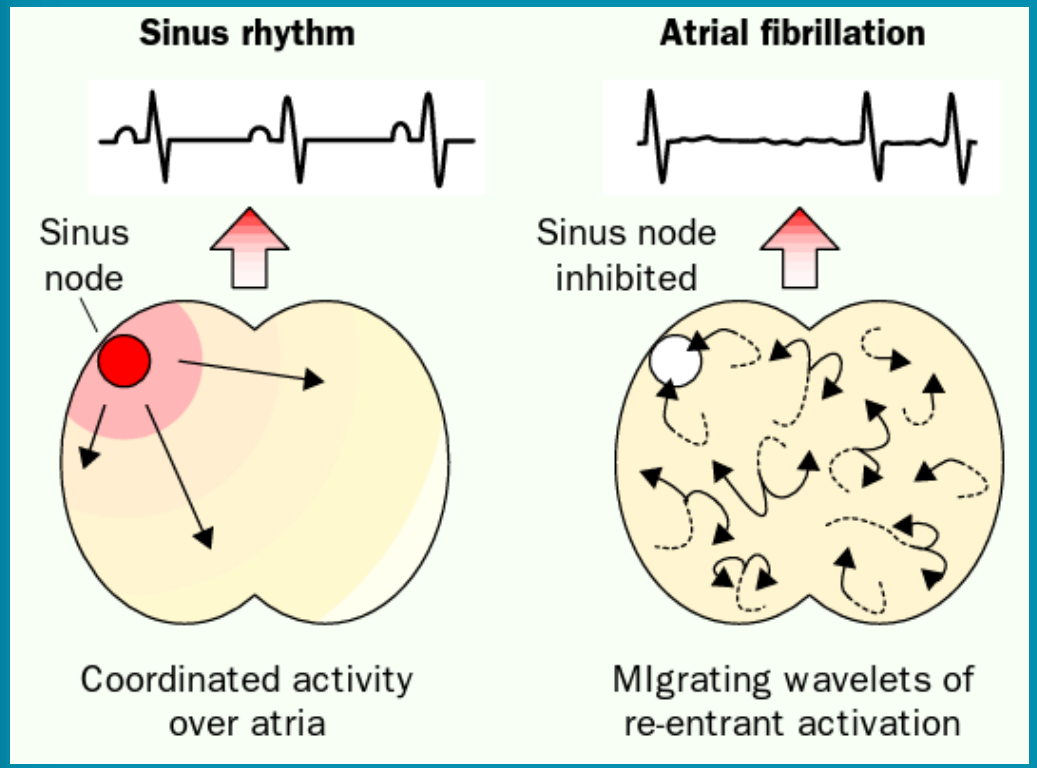
If you answered "occasionally" or "often" to any of the above questions, to what degree does it disrupt what you're doing when it occurs?

◯ I barely notice it ◯ I need to stop to address it
◯ I pause momentarily

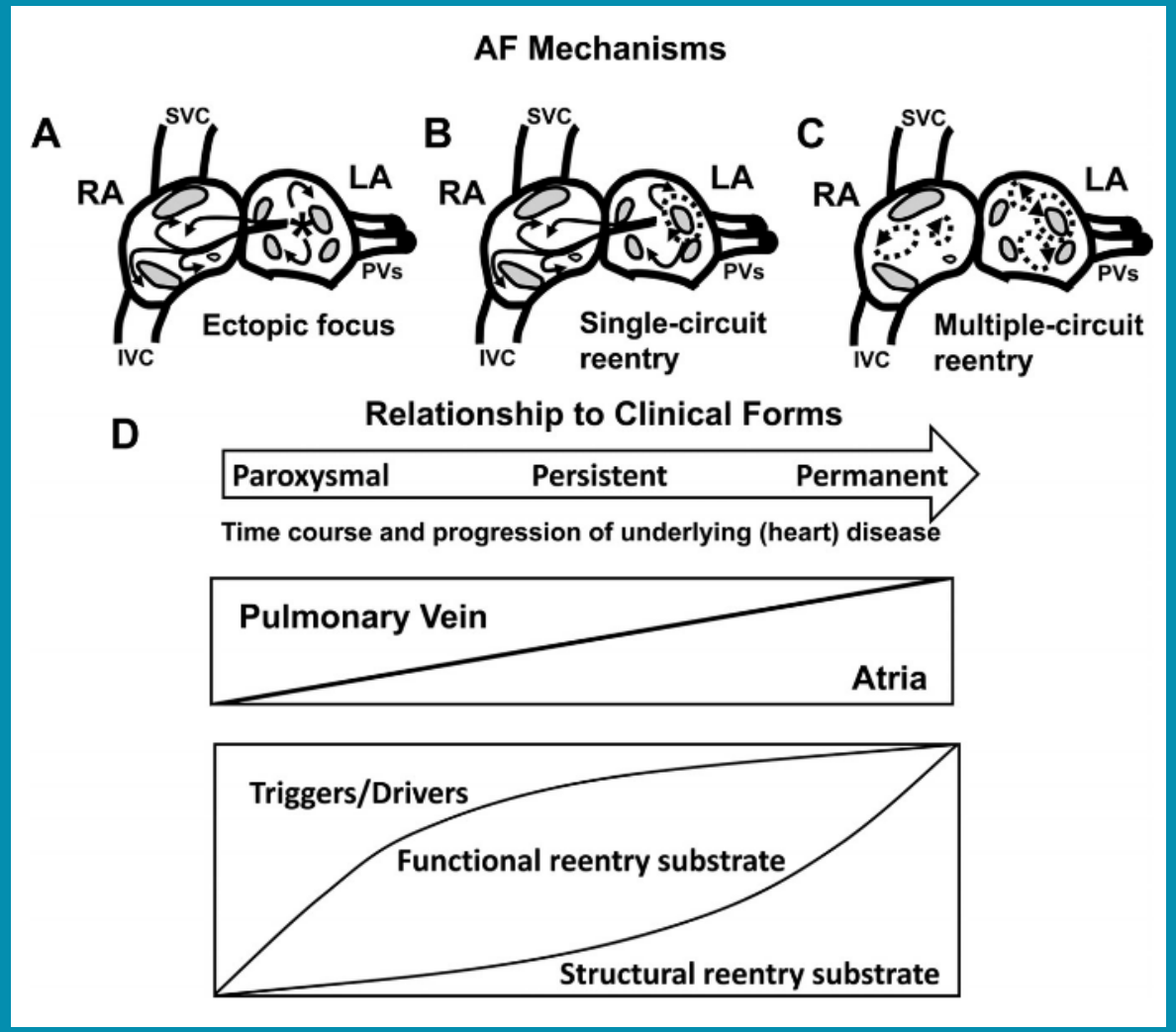
Write in: What type of activities cause you to become physically tired?

The American Heart Association and StopAfib.org are collaborating to support atrial fibrillation patients.

What is AF?? Is it all the same??



Narayan, Lancet 1997



Iwasaki, Circ 2011

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What Are Your Options??

- Rate Control
  - Beta blockers, CCBs, Digoxin

- Rhythm Control
  - Antiarrhythmics (Class IC, III)

  - Catheter Ablation

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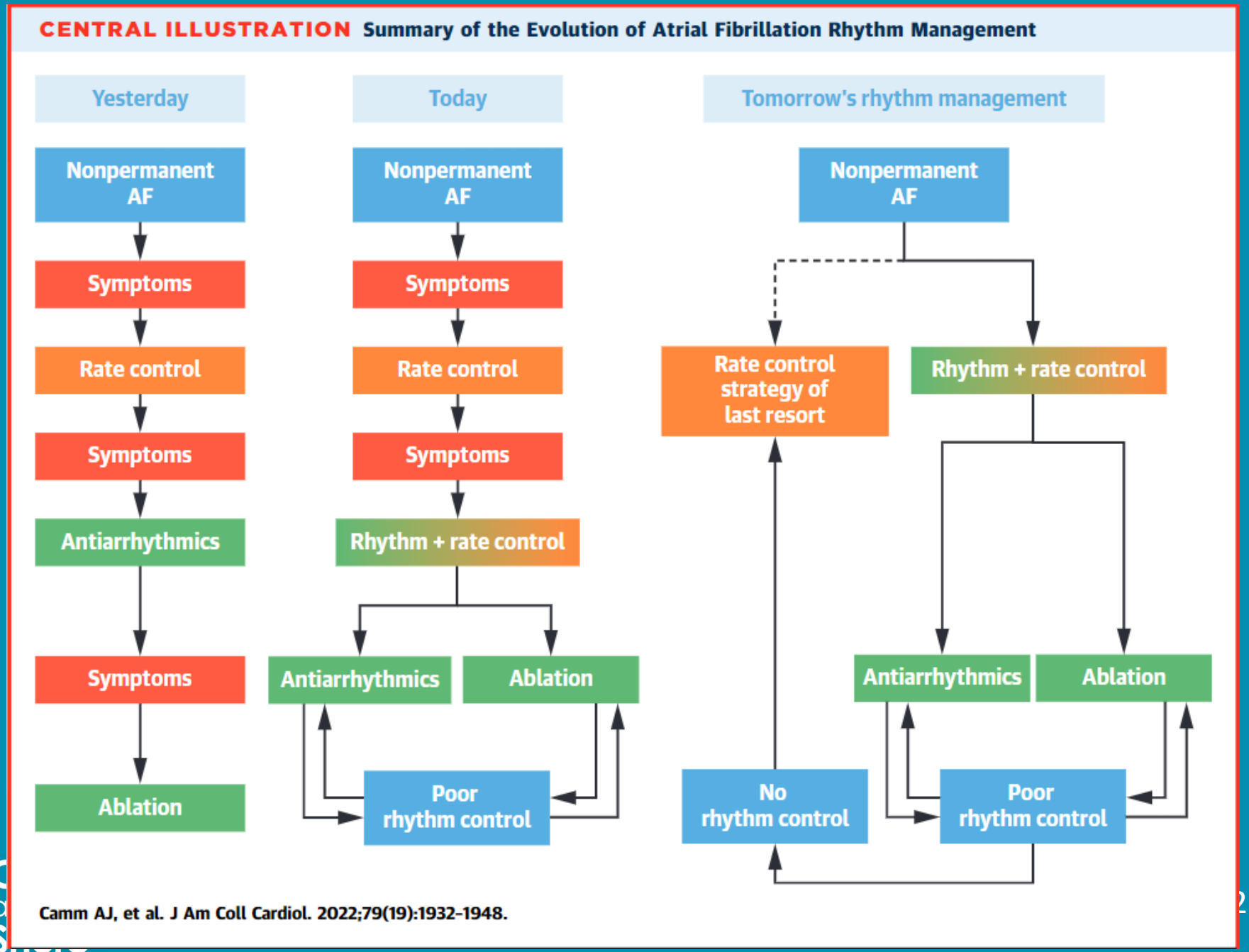
Trial[a]	N	Follow-Up	AF Classification	Rhythm-Control Strategy[b]	Rate-Control Strategy	Anticoagulation
PIAF[17]	252	1 y	Persistent AF	Amiodarone for 3 wks, cardioversion thereafter if needed. Amiodarone for maintenance. For recurrences, therapy as needed at physician's discretion.	Diltiazem. Additional therapy as needed at physician's discretion.	All patients
AFFIRM[18]	4,060	Mean: 3.5 y; maximum: 6 y	Recurrent non-permanent AF	At physician's discretion: amiodarone (62.8% used at any time), disopyramide (4.3%), flecainide (8.3%), moricizine (1.7), procainamide (8.5%), propafenone (14.5%), quinidine (7.4%), sotalol (41.4%) and combinations of these. Dofetilide could be used once available (0.6%).	At physician's discretion: beta-blockers, calcium-channel blockers (verapamil and diltiazem), digoxin, or combinations of these.	Continuous OAC encouraged in the rhythm-control group, but could be stopped at physician's discretion.[c]
RACE[19]	522	Mean: 2.3 y	Persistent AF or AFL	Electrical cardioversion then AAD therapy with sotalol. Amiodarone, flecainide, and propafenone used for recurrences.	Digitalis, a nondihydropyridine calcium-channel blocker, or a beta-blocker, alone or in combination.	OAC for 4 wks before and 4 wks after cardioversion. OAC could be stopped at 1 mo.[d]
STAF[147]	200	36 mo	Persistent AF	Internal or external cardioversion, with repeated cardioversions for AF recurrence. For prophylaxis of AF recurrence: class I AADs or sotalol[e], or beta-blocker and/or amiodarone.[f]	Beta-blockers, digitalis, calcium antagonists, or AV-nodal ablation/modification with/without a pacemaker.	All patients
AF-CHF[20]	1,376	Mean: 37 mo; maximum 74 mo	History of AF with ECG documentation[g]	Aggressive therapy with AADs and electrical cardioversion within 6 wks of randomization if sinus rhythm not attained. Repeat cardioversions for AF recurrence. Amiodarone for maintenance and sotalol or dofetilide if required. Amiodarone (82%), dofetilide (<1%), and sotalol (2%).	Adjusted doses of beta-blockers with digitalis. AV-nodal ablation with pacemaker recommended if target heart rate not met.	All patients
J-RHYTHM[22]	885	Mean: 578 d	Paroxysmal AF	AADs according to contemporaneous Japanese guidelines.[148] Amiodarone (0.5%), aprindine (7.2%), bepridil (6.7%), cibenzoline (20.8%), disopyramide (8.8%), flecainide (8.1%), pilsicainide (32.5%), pirmenol (1.0%), and propafenone (11.7%).	Beta-blockers, calcium-channel blockers, or digitalis.	All patients[h]


CENTRAL ILLUSTRATION Summary of the Evolution of Atrial Fibrillation Rhythm Management
Yesterday
Nonpermanent AF
Symptoms
Rate control
Symptoms
Antiarrhythmics
Symptoms
Ablation
Today
Nonpermanent AF
Symptoms
Rate control
Symptoms
Rhythm + rate control
Antiarrhythmics
Ablation
Poor rhythm control
Tomorrow's rhythm management
Nonpermanent AF
Rate control strategy of last resort
Rhythm + rate control
Antiarrhythmics
Ablation
No rhythm control
Poor rhythm control
Camm AJ, et al. J Am Coll Cardiol. 2022;79(19):1932-1948.

SPONTANEOUS INITIATION OF ATRIAL FIBRILLATION BY ECTOPIC BEATS ORIGINATING IN THE PULMONARY VEINS

MICHEL HAÏSSAGUERRE, M.D., PIERRE JAÏS, M.D., DIPEN C. SHAH, M.D., ATSUSHI TAKAHASHI, M.D., MÉLÈZE HOCINI, M.D., GILLES QUINIOU, M.D., STÉPHANE GARRIGUE, M.D., ALAIN LE MOUROUX, M.D., PHILIPPE LE MÉTAYER, M.D., AND JACQUES CLÉMENTY, M.D.

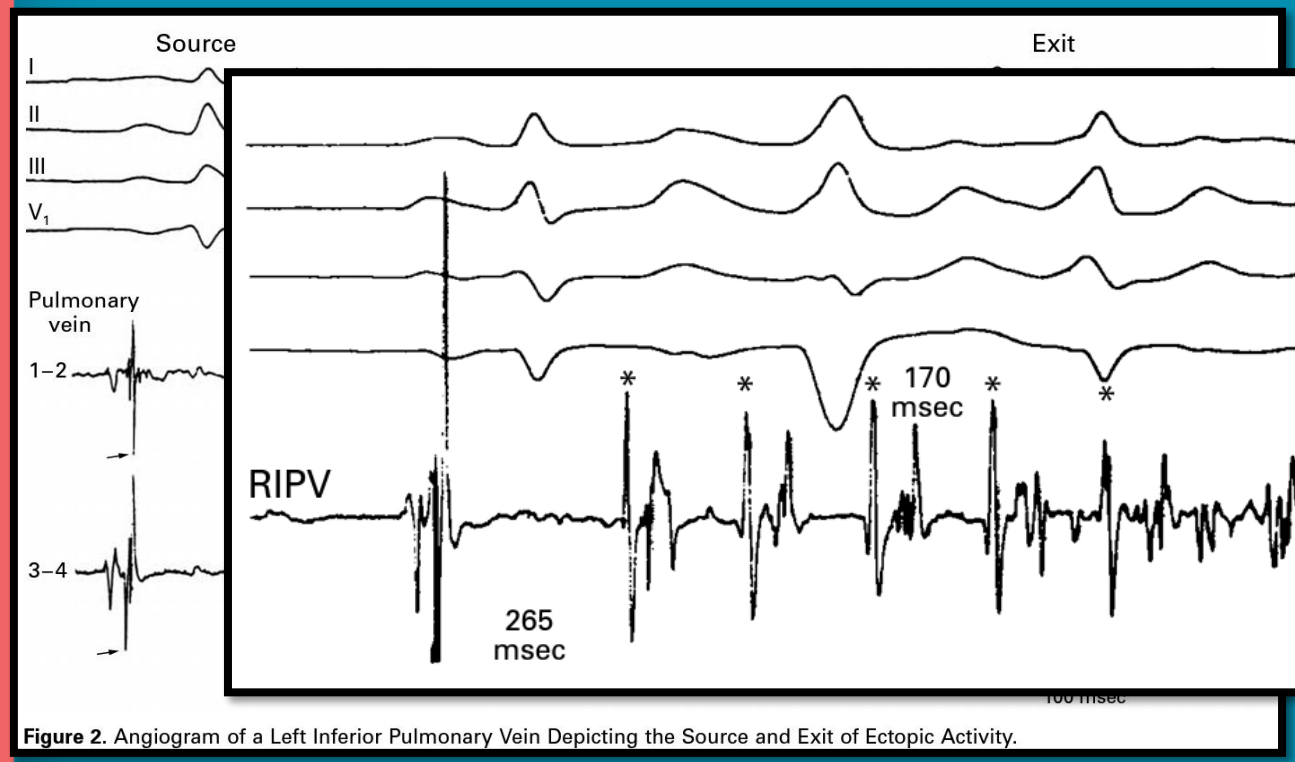


Figure 2. Angiogram of a Left Inferior Pulmonary Vein Depicting the Source and Exit of Ectopic Activity.

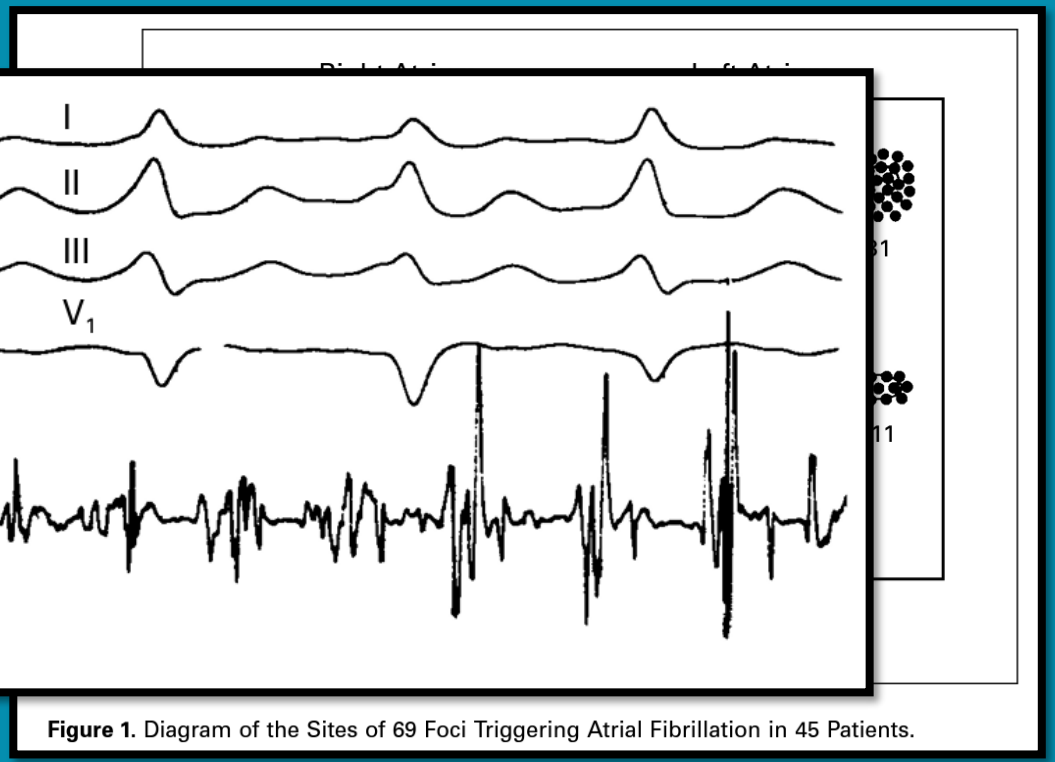


Figure 1. Diagram of the Sites of 69 Foci Triggering Atrial Fibrillation in 45 Patients.

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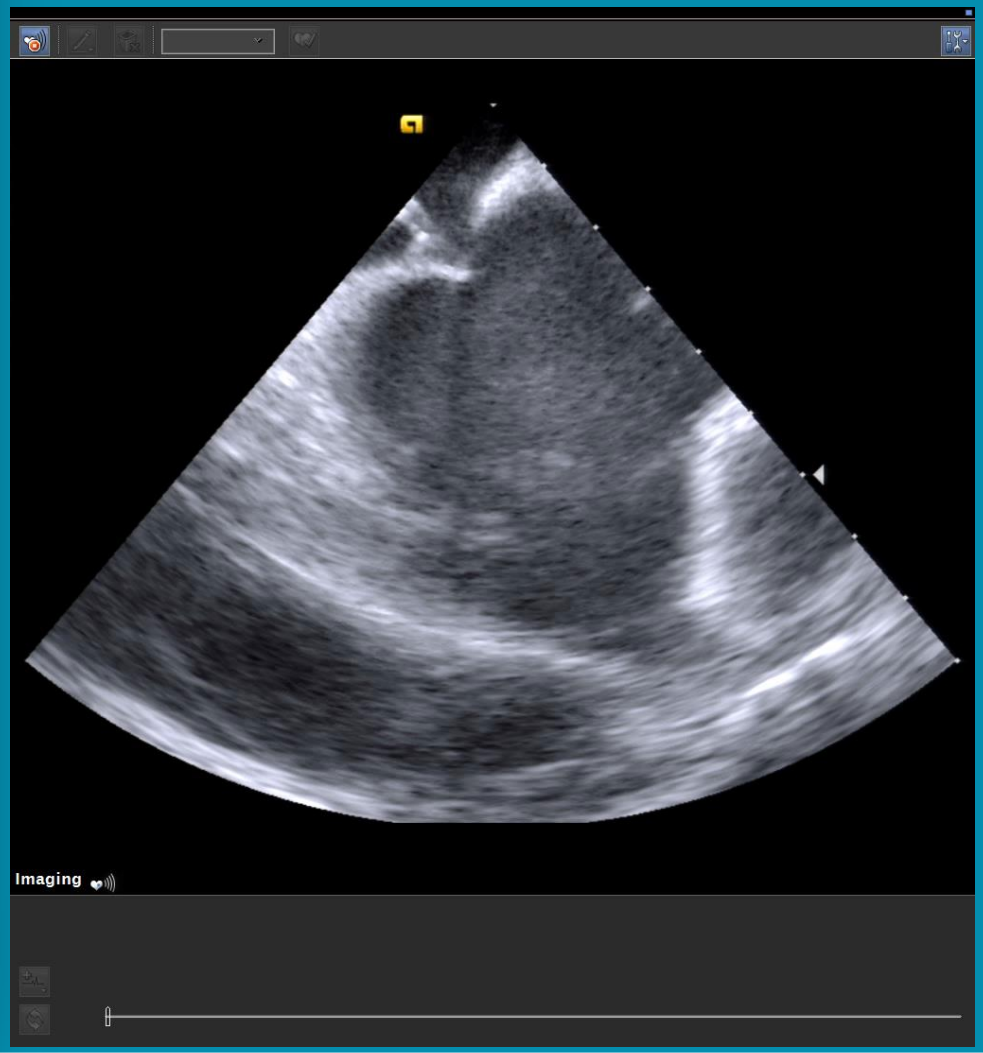
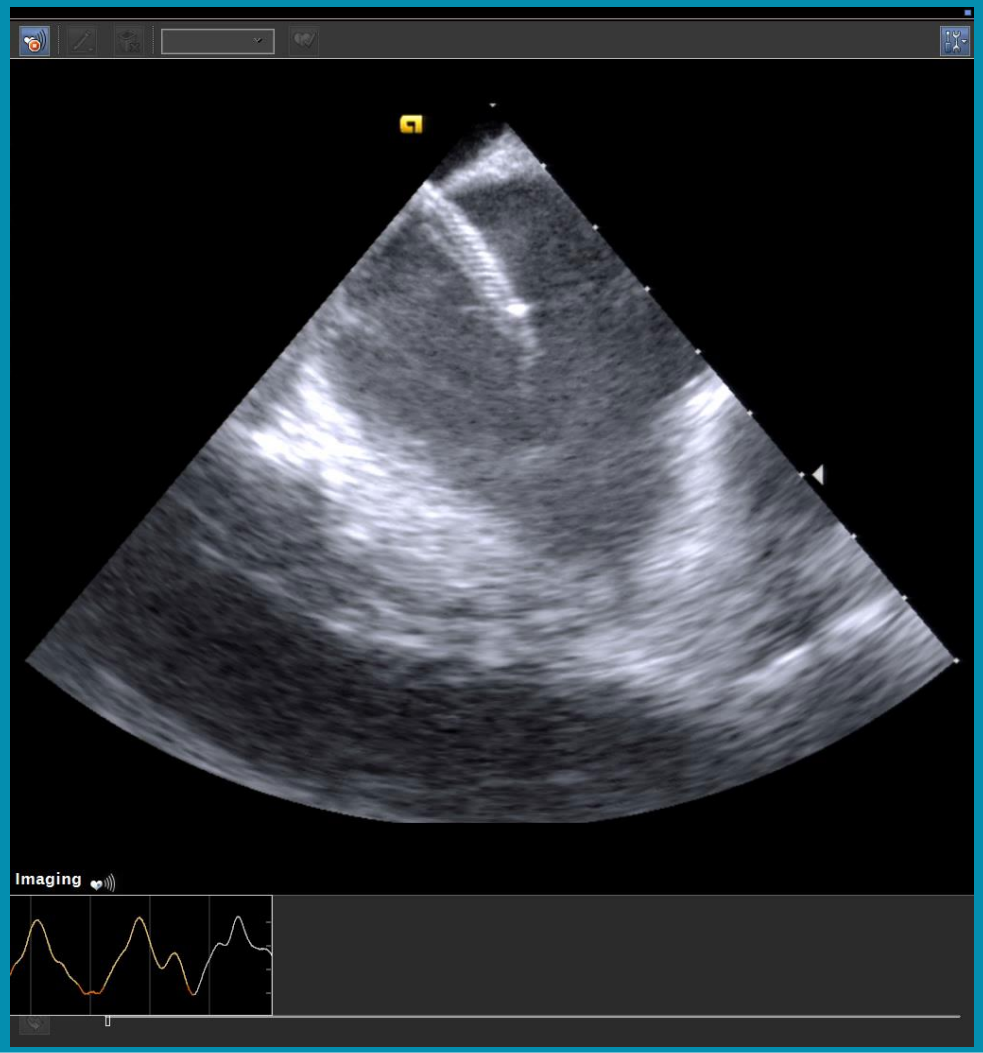
Haissaguerre, NEJM 1998

AF Procedure

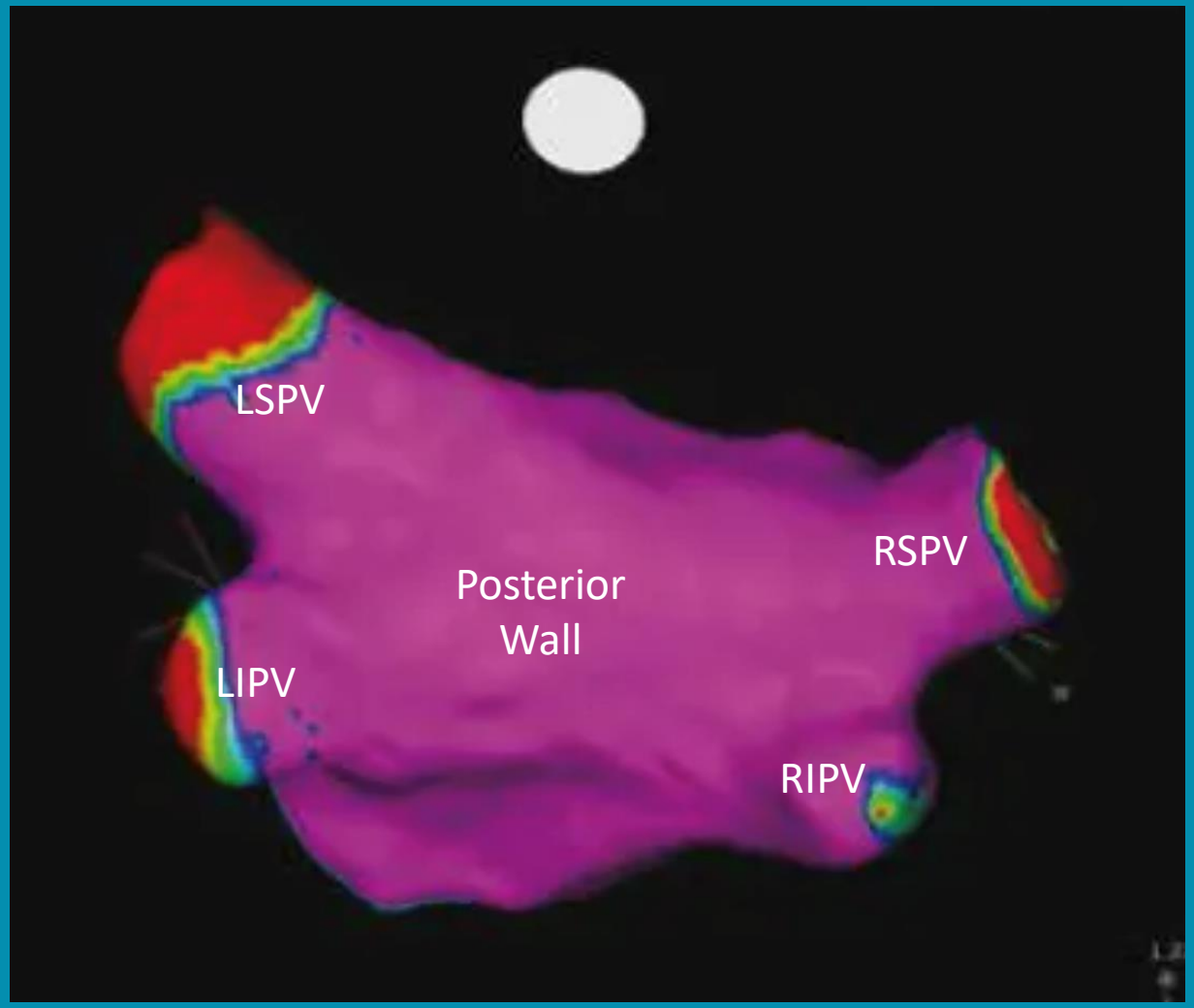
Transseptal Access



Catheter Placement



Newly Diagnosed AF



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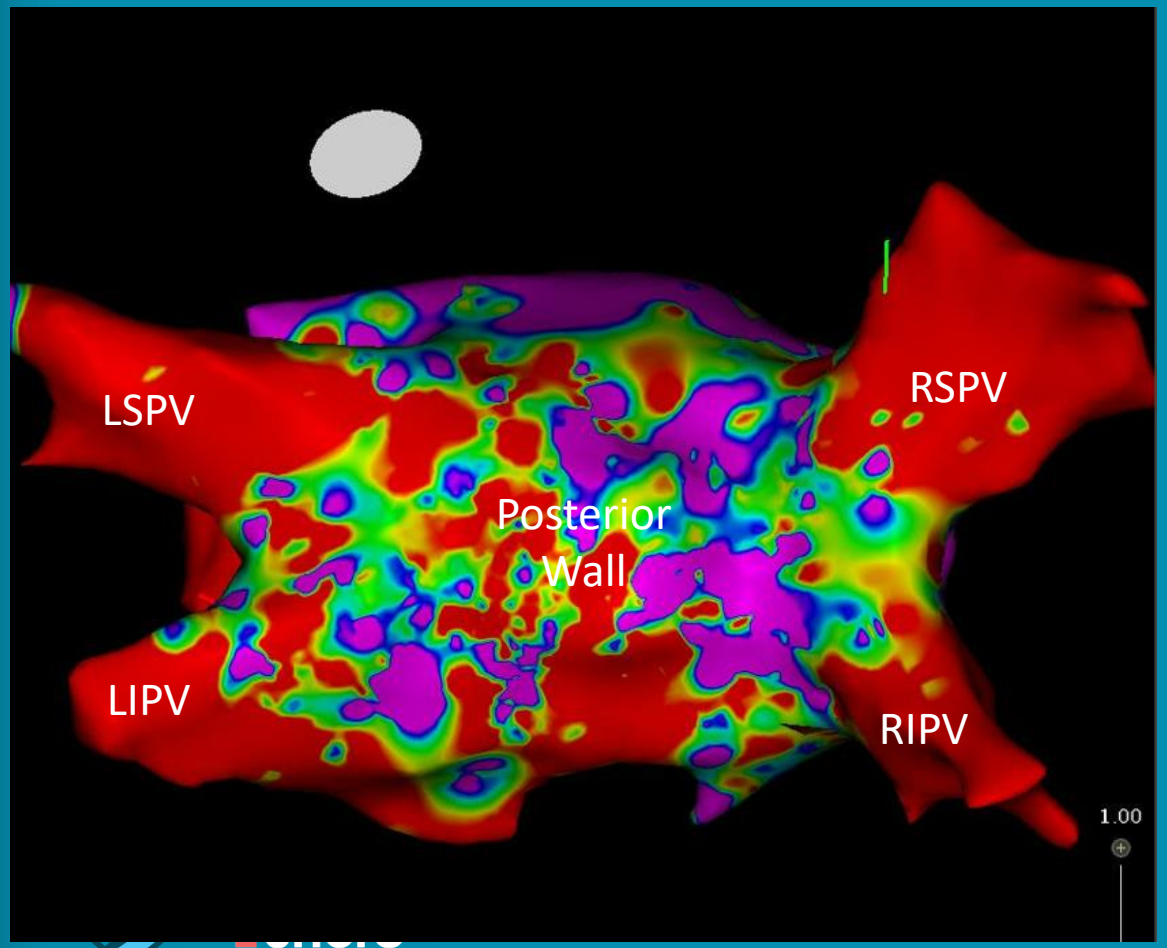
Persistent AF

Before Ablation



After Ablation

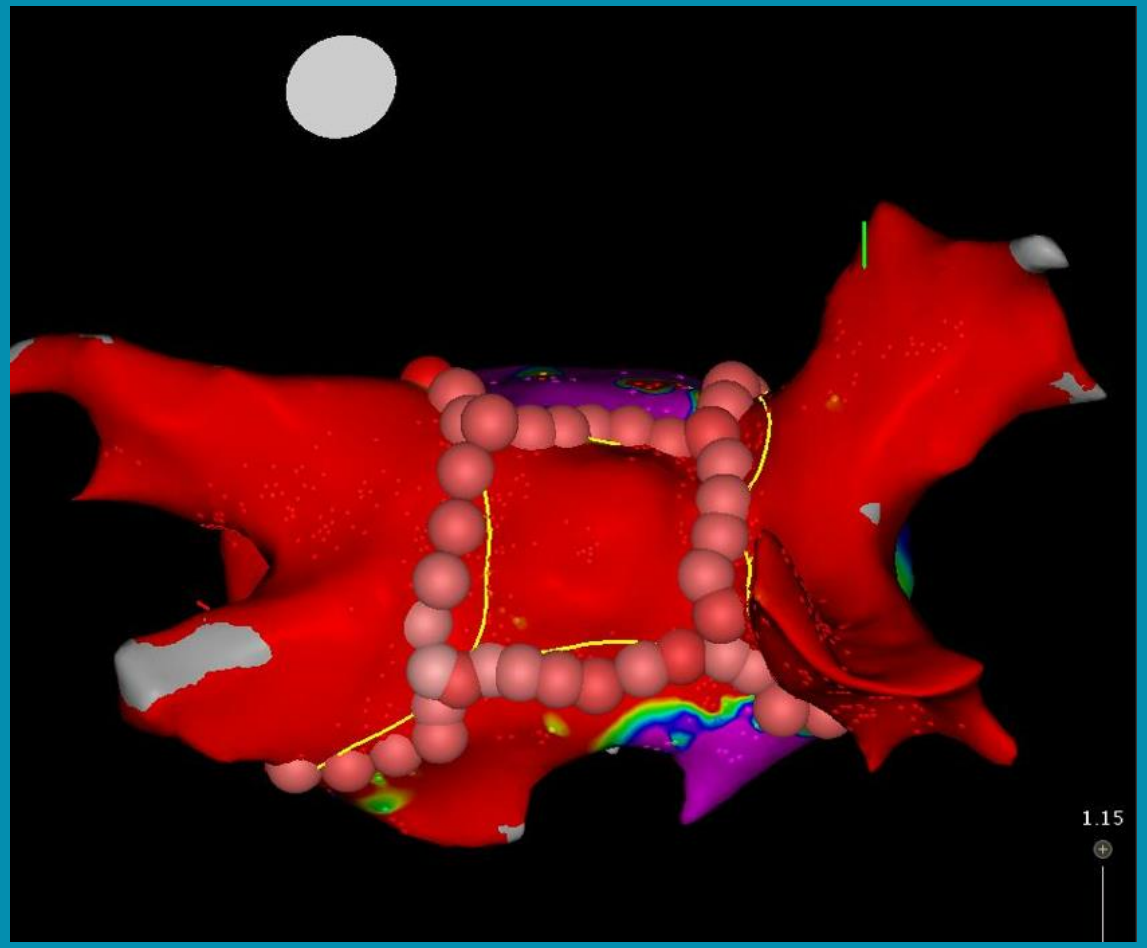
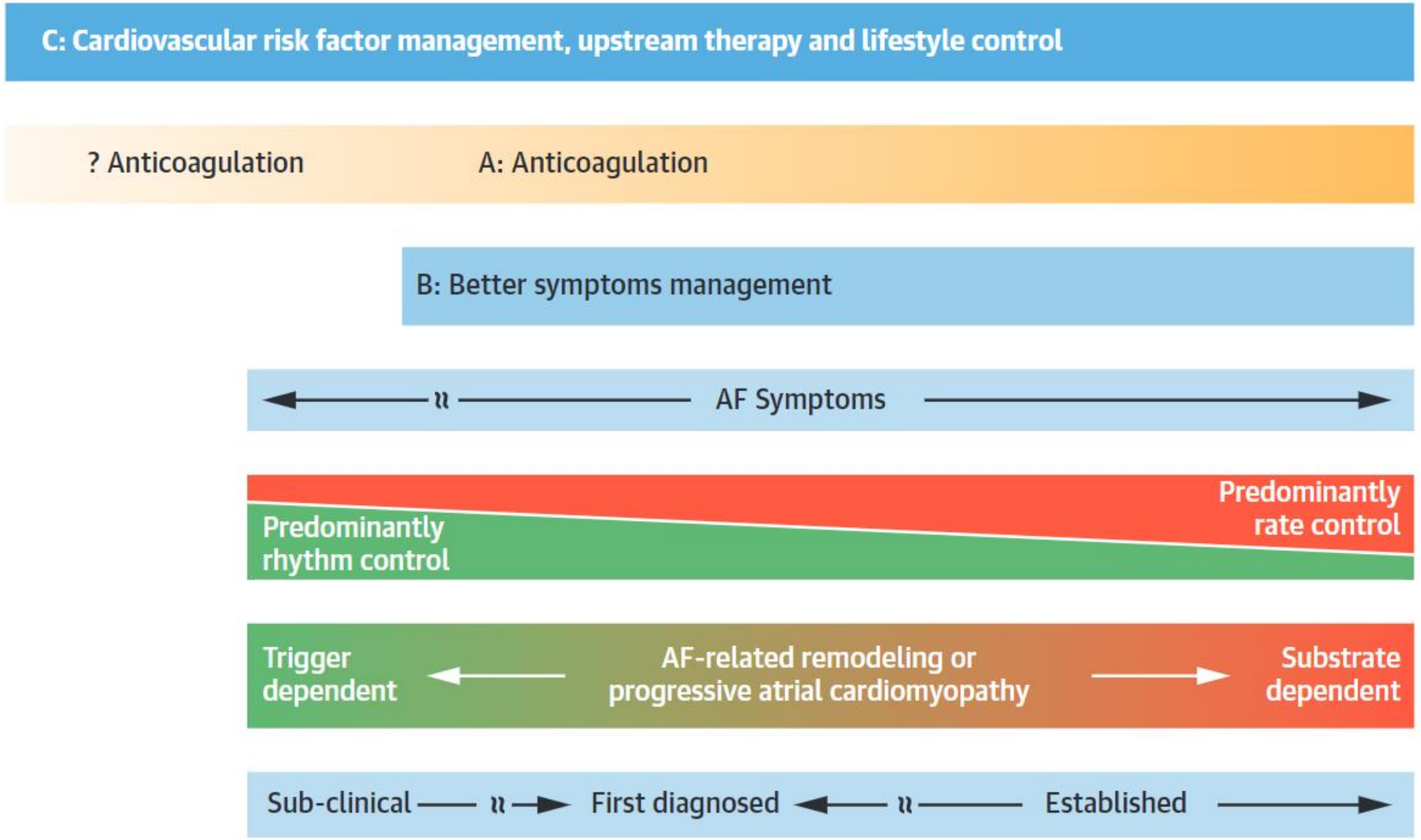
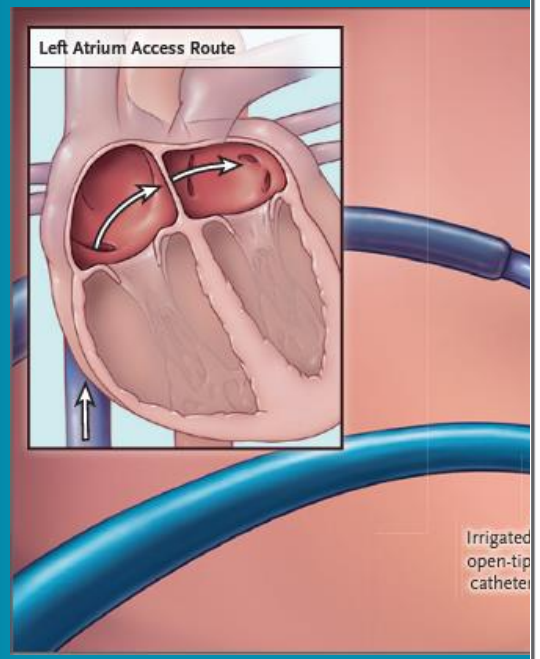


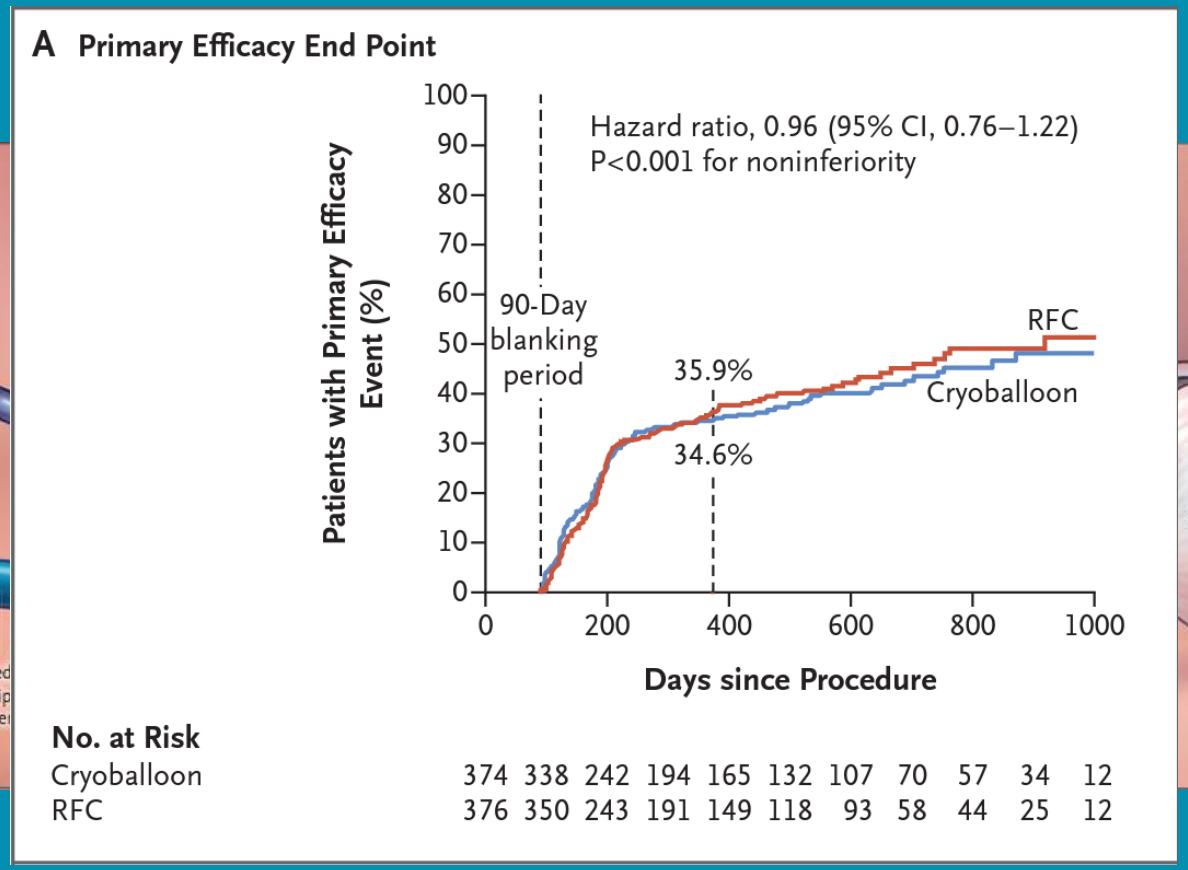
FIGURE 3 Rhythm Management in AF and Underlying Progression of Atrial Cardiomyopathy/Remodeling

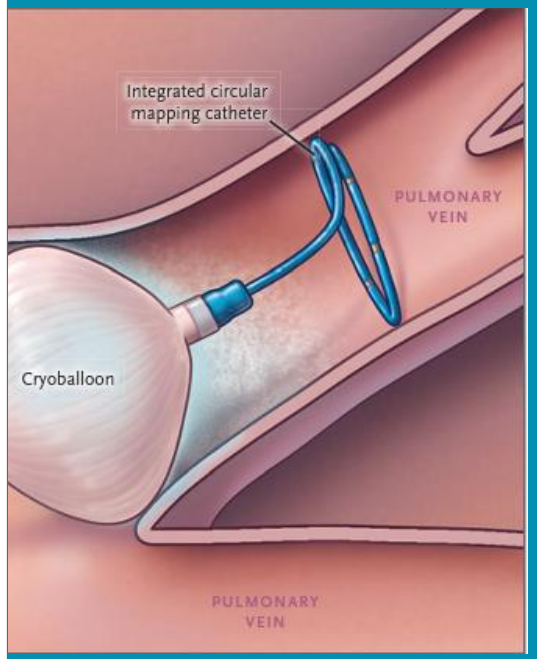


Camm et al. JACC 2022

Ablation Modalities – FIRE & ICE







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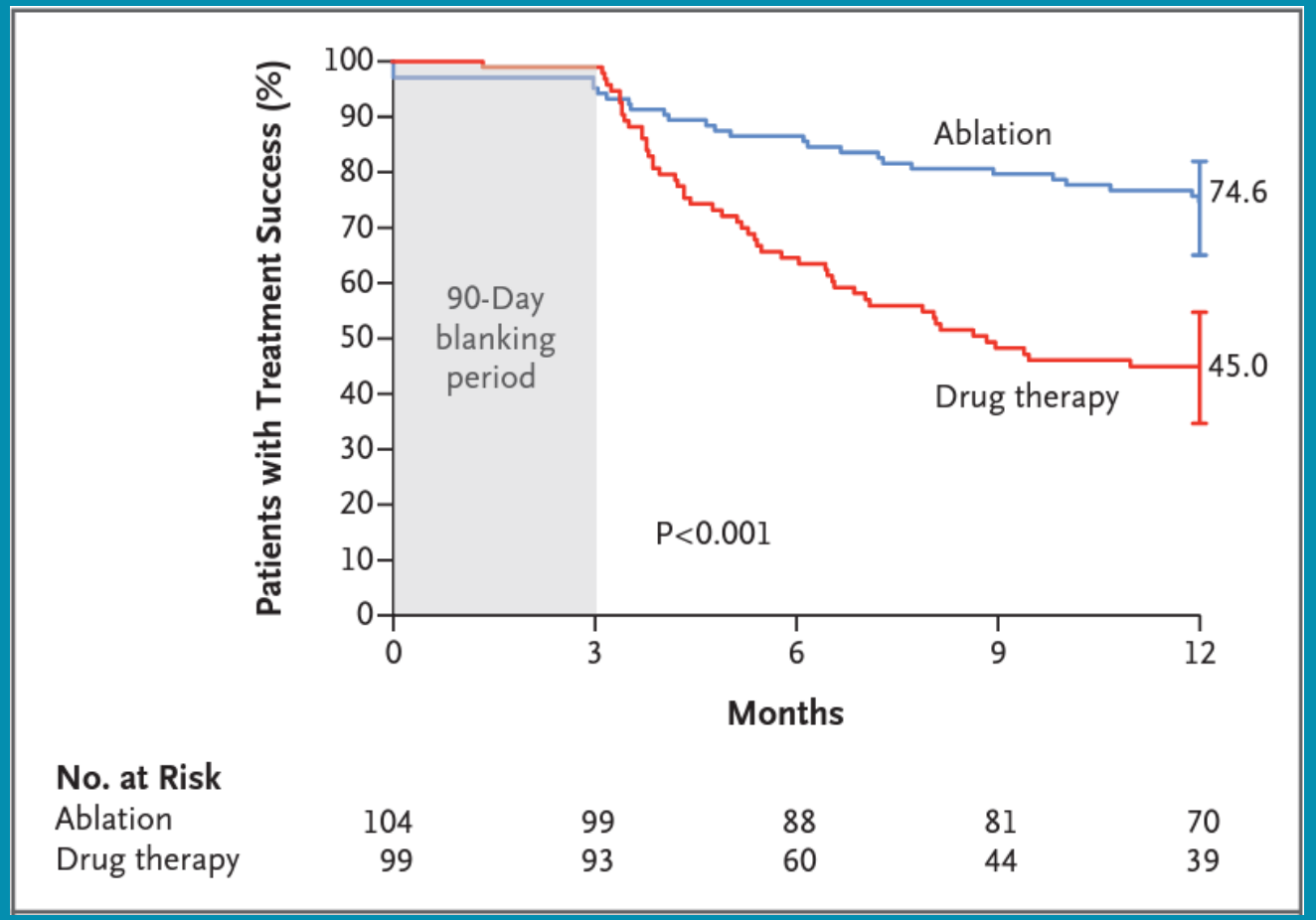
Kuck et al. NEJM 2016

STOP AF First Trial

- PAF and no prior rhythm control
- Randomized AAD vs Cryoablation
- Concluded cryo as first line superior to drug therapy for preventing AF



Wazni et al. NEJM 2021

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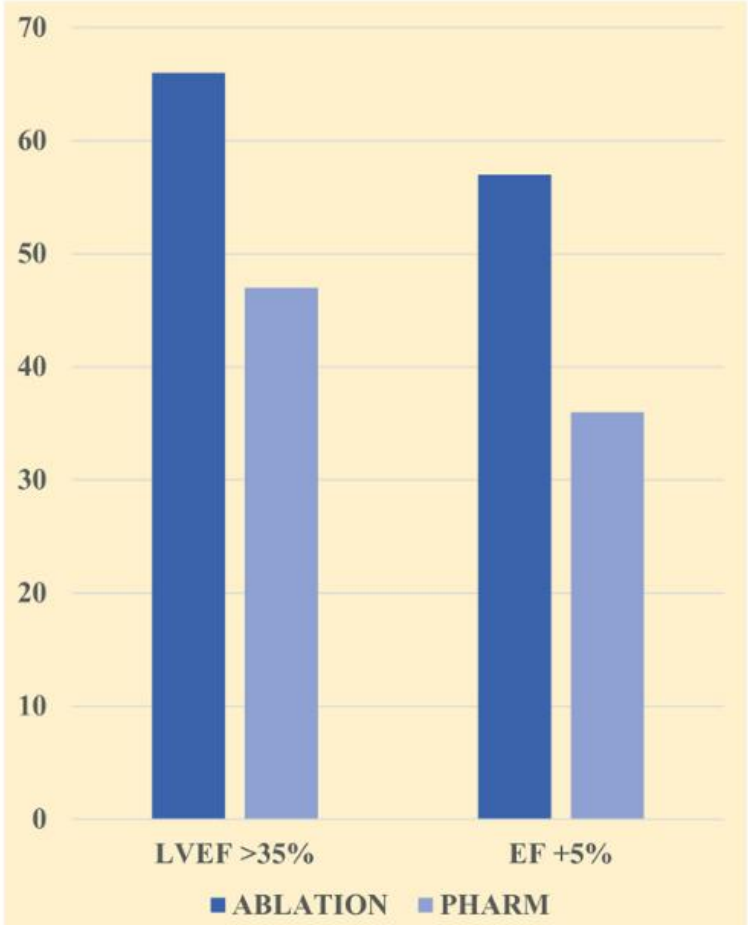
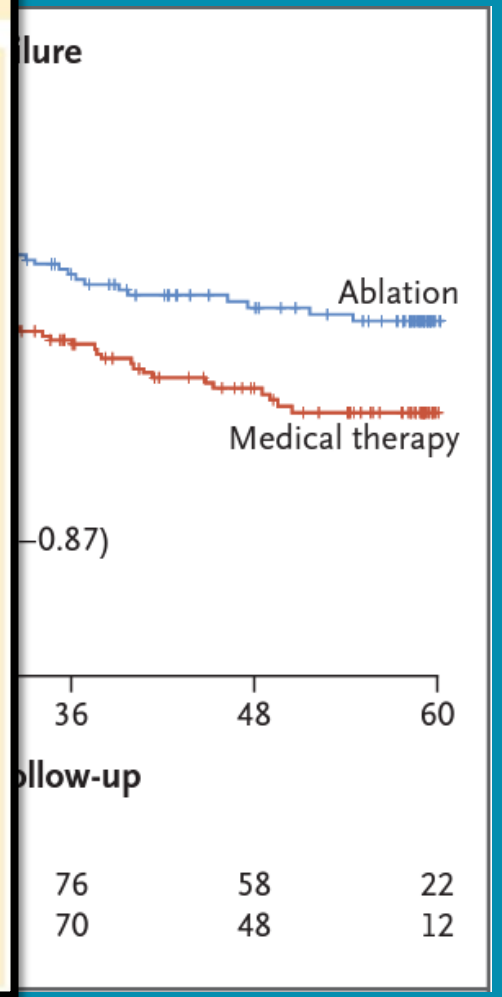
AF in Heart Failure Patients – CASTLE AF

- Ablation in C
  associated v
  lower rate o
  death and h
  heart failure
  therapy
- Also showe
  mortality, wh
  significantly
  cardiovascu
  ablation gro
- Furthermore
  reduced the
  fibrillation, ir
  walk, and in

CASTLE-AF IMPROVEMENT IN LVEF

The CASTLE-AF patients HF and AF (n=363) randomized multicenter prospective controlled trial: ablation (n=179) vs pharmacological therapy (n=184).
In the ablation arm, a significantly higher number of patients experienced an improvement in their LVEF to >35% (OR=2.17; p<0.001).



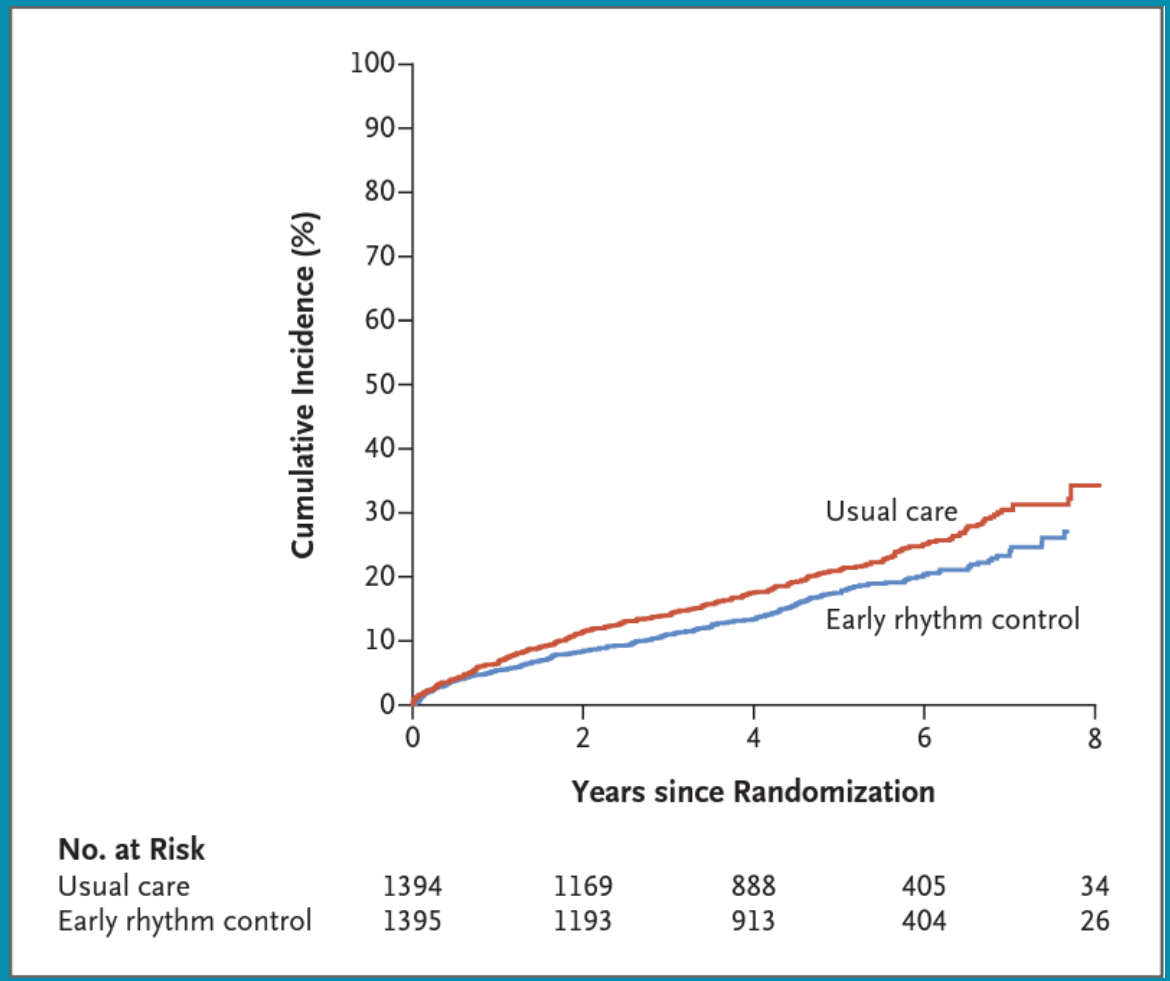


Marrouche et al. NEJM 2018

Cors at the Shore 2023

Recently Diagnosed AF – EAST-AFNET 4

- AF diagnosis within 1 year were randomized in a 1:1 fashion to either early rhythm control (ERC) or usual care (rate control)
- Early Tx = AADs or ablation or cardioversion
- ERC was associated with a lower risk of adverse cardiovascular outcomes than usual care among patients with early atrial fibrillation and cardiovascular conditions

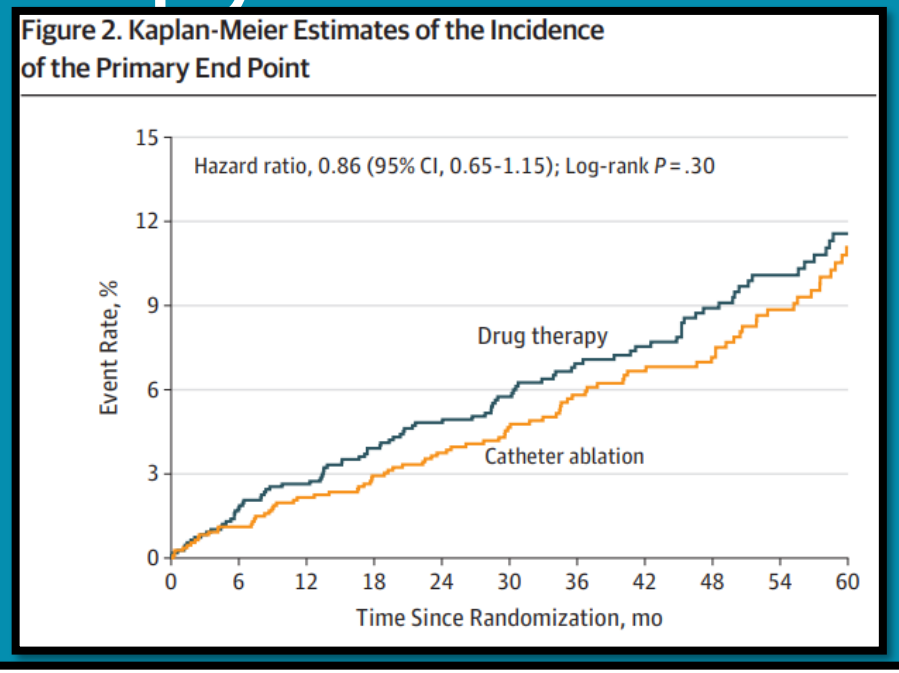


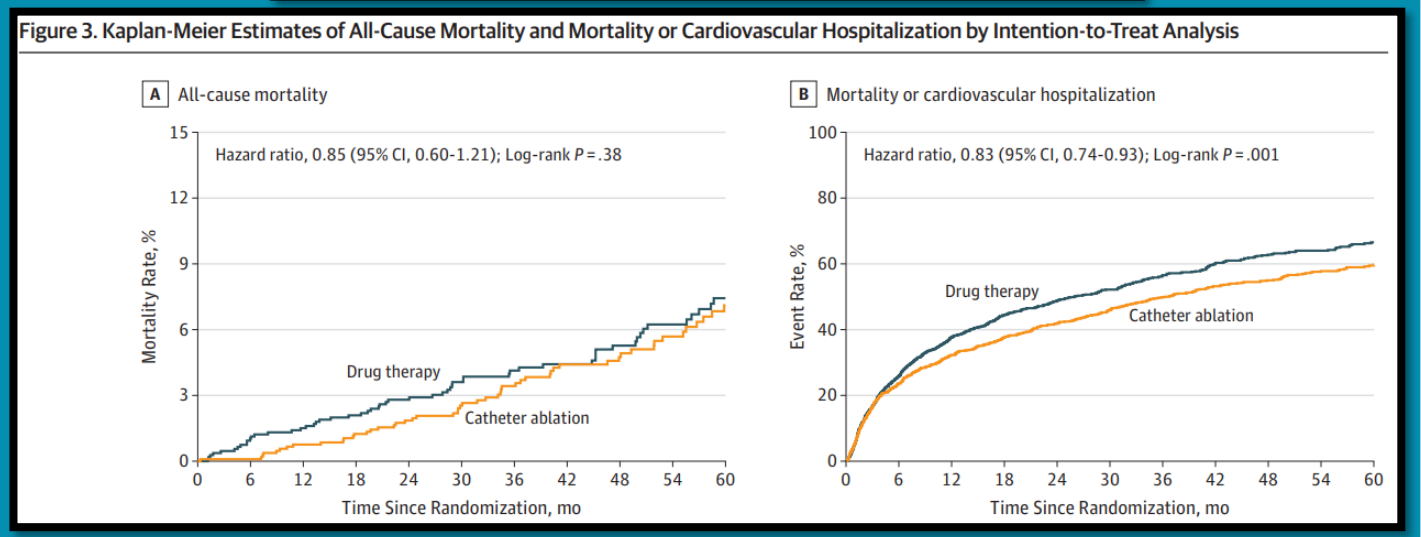
Kirchhof et al. NEJM 2020

Cors at the Shore 2023

Ablation vs Medical Therapy - CABANA

- Primary endpoint: composite of death, disabling stroke, bleeding, cardiac arrest
- Med Tx = Rate or rhythm control
- Ablation not superior to drug therapy for CV outcomes at 5 years (ITT analysis)



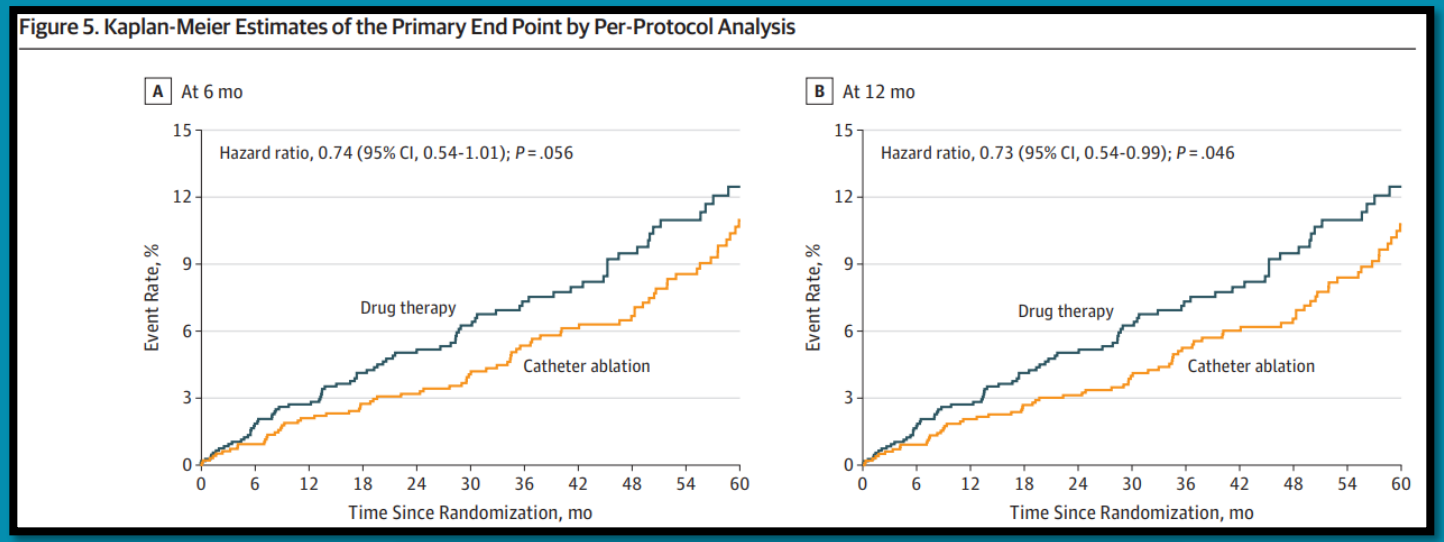


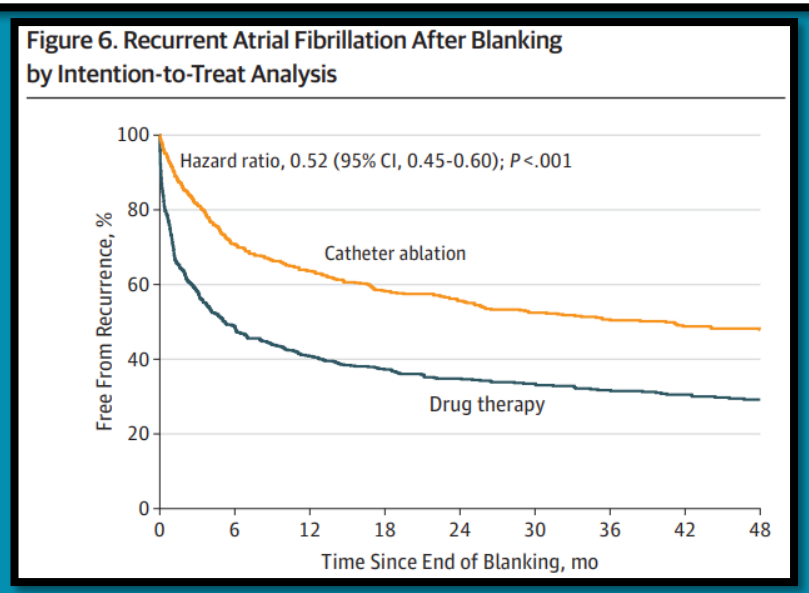
Packer et al. JAMA 2019

Cors at the Shore 2023

Ablation vs Medical Therapy - CABANA

- There was a significant reduction in death or CV hospitalization with ablation
- Per-protocol analysis showed ablation with superior efficacy to drug therapy
- Catheter ablation was associated with a significant reduction in recurrent AF compared with drug therapy.





Packer et al. JAMA 2019

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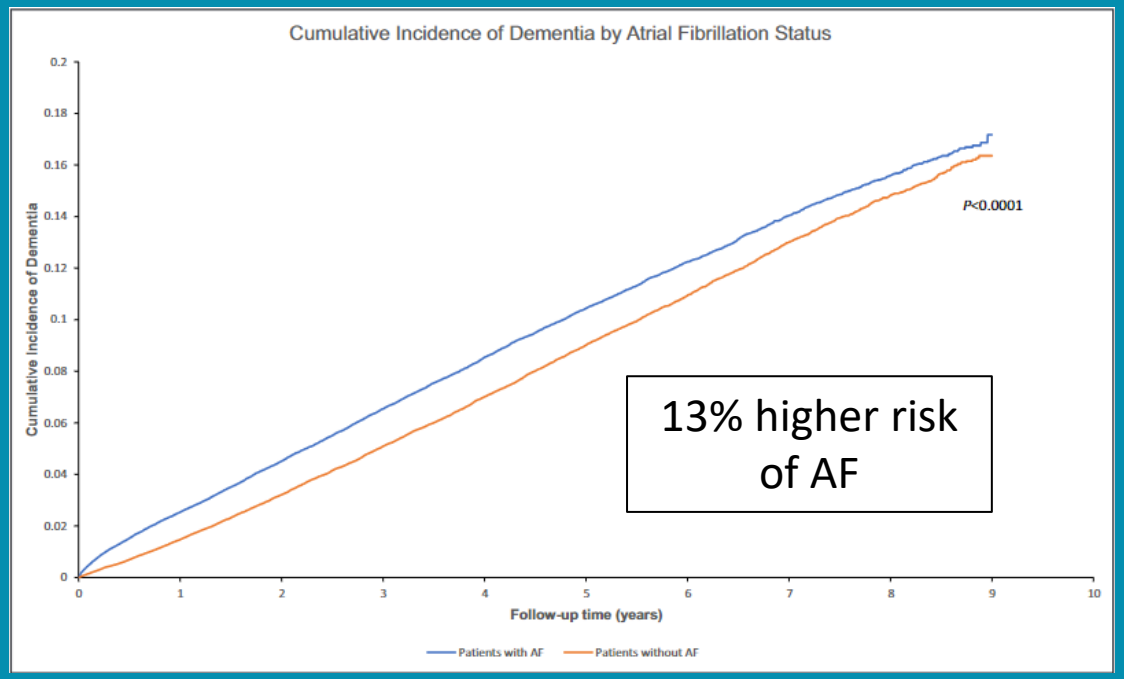
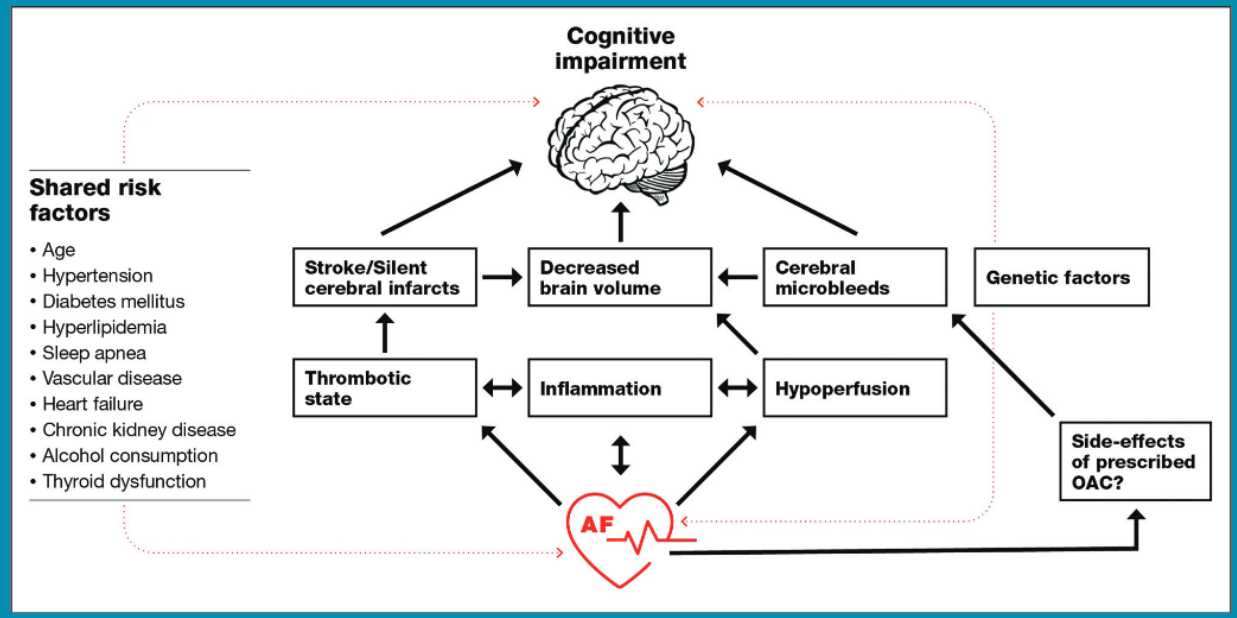
AF and Dementia

- Growing evidence suggests a consistent association between AF and cognitive impairment/dementia that is independent of clinical stroke risk.
- While AF and dementia share numerous risk factors, the association appears to be independent of these variables.



Bansal et al. JAHA 2023



Rivard et al. Circ 2022

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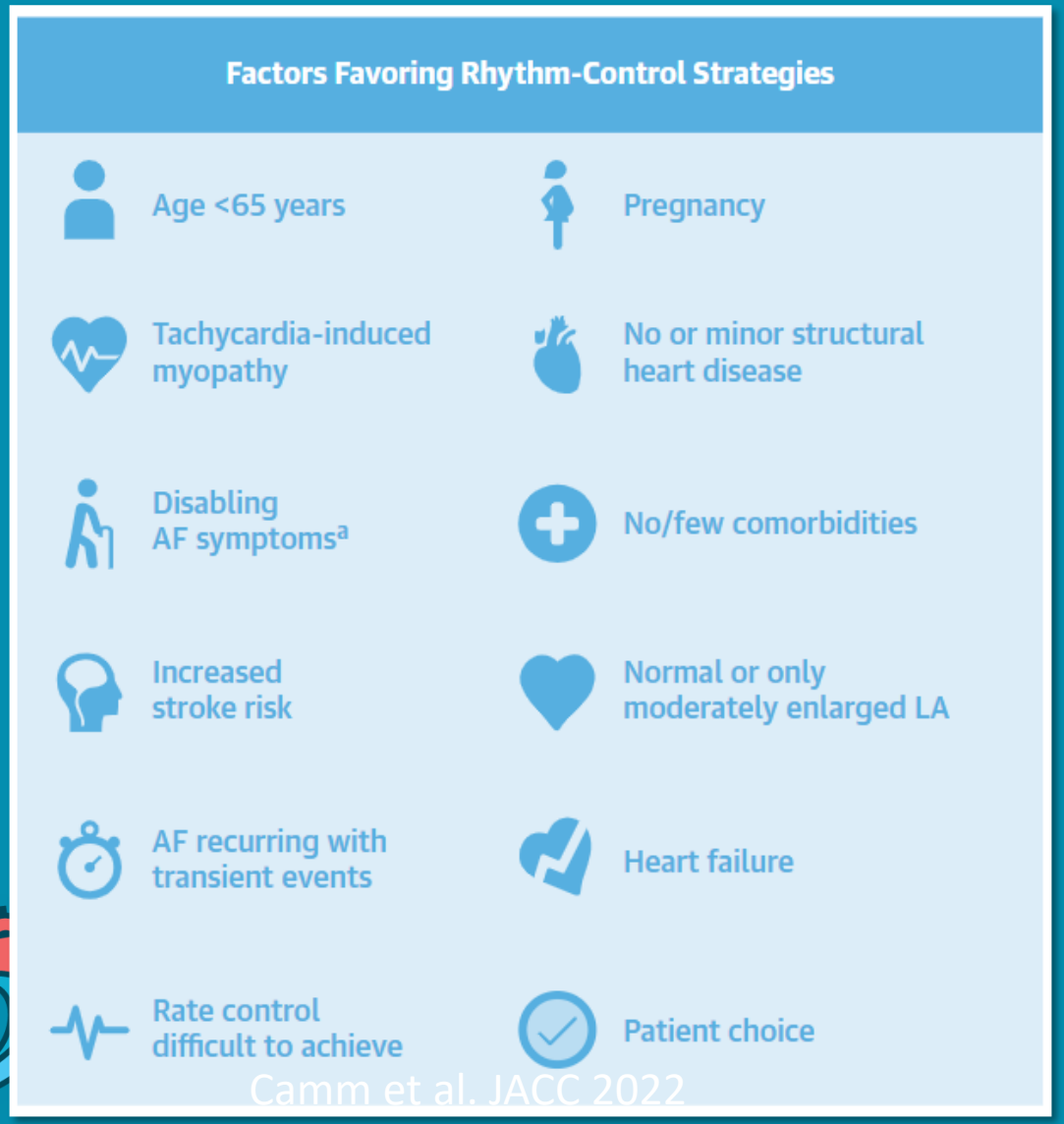
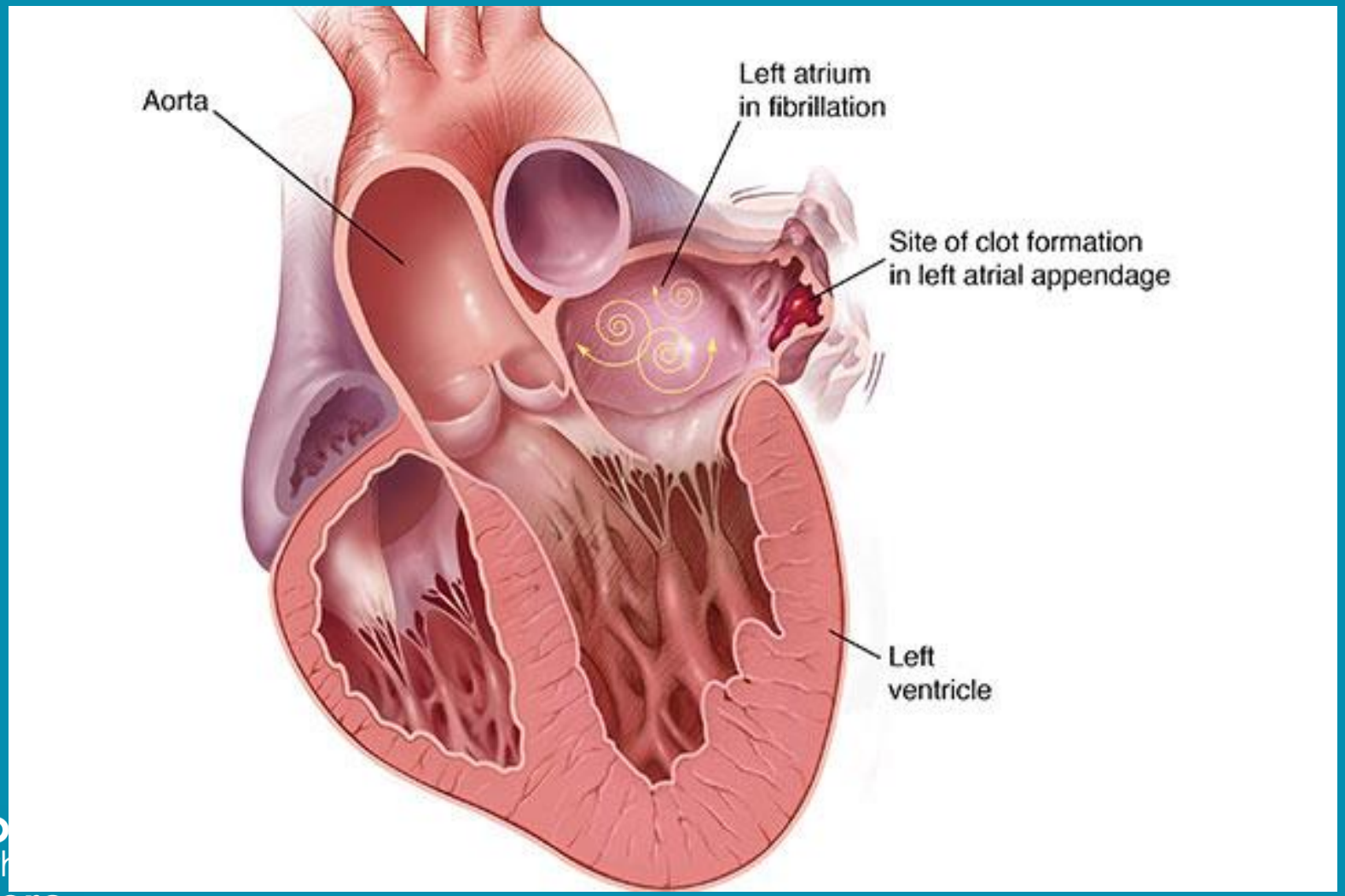
When to Refer For Ablation – My Thoughts



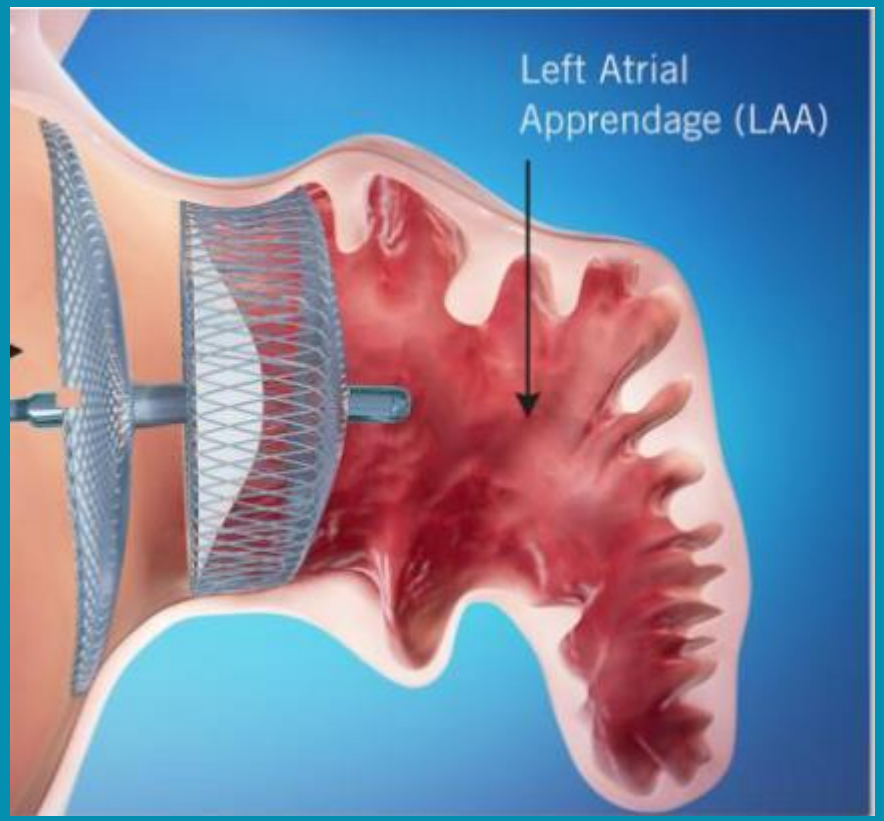
Camm et al. JACC 2022

- Younger age patients
- Recent onset
- Patients with heart failure
- Patient preference
- Difficulty with rate control
- Patients with prior cardiac surgical manipulation

LAA Closure


Aorta
Left atrium
in fibrillation
Site of clot formation
in left atrial appendage
Left
ventricle

LAA Closure



Amulet

Watchman

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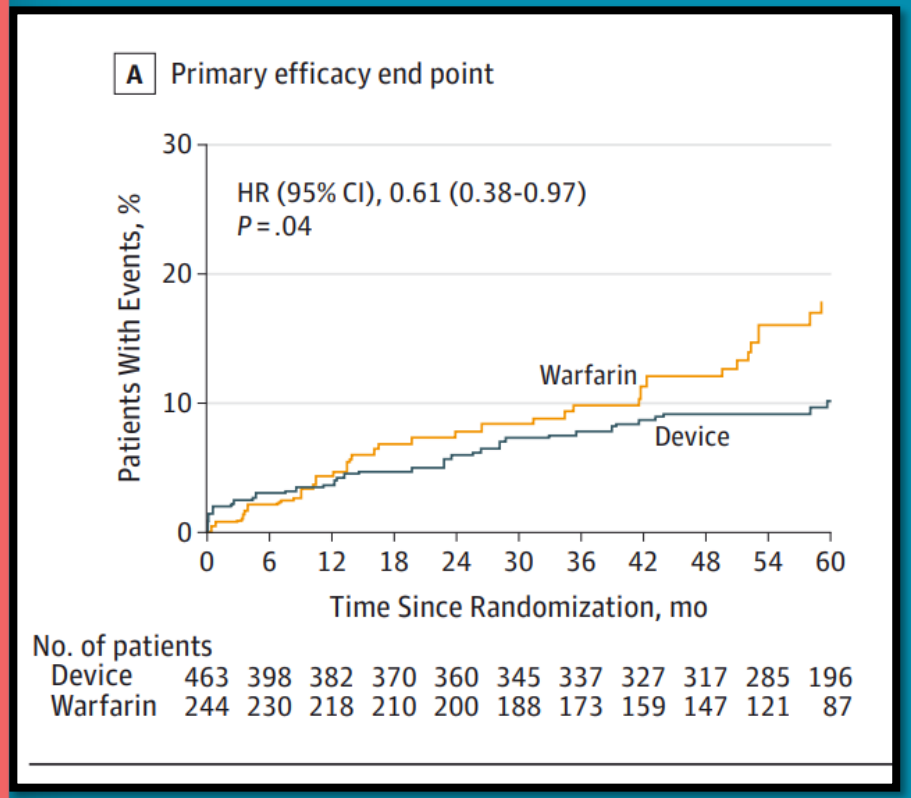
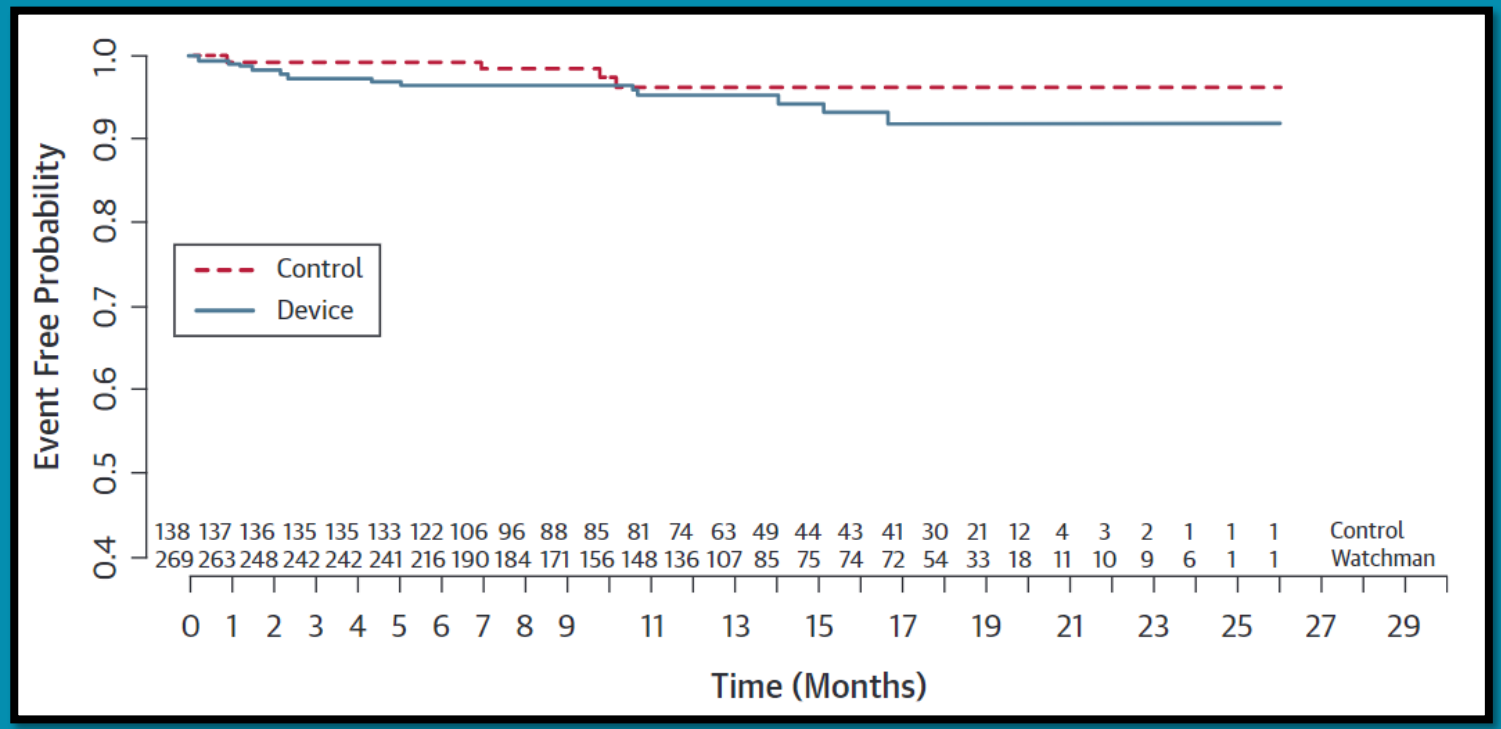
LAA Closure vs Warfarin



Reddy et al. JAMA 2014



Holmes et al. JACC 2014

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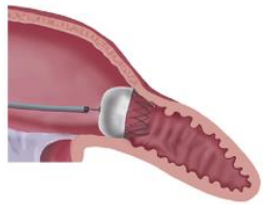
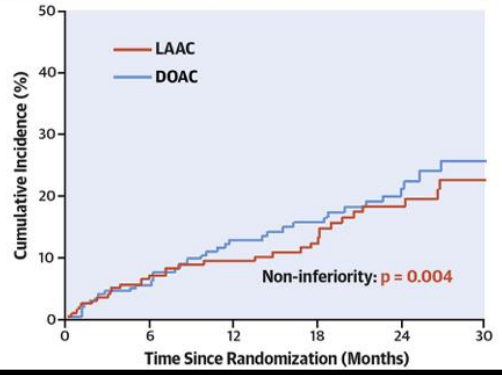
LAA Closure vs DOAC

PRAGUE-17 Randomized Clinical Trial

- 402 High-Risk AF Pts ➡ Randomized
  - CHA_2DS_2-VASc = 4.7 ± 1.5
  - HAS-BLED = 3.1 ± 0.9
- Follow-up: 20.8 ± 10.8 mo (695 pt-year)



Primary Endpoint
Stroke, TIA, SE, CV Death, Bleeding, or Complications

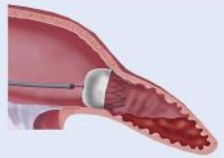


	sHR (95% CI)	p value
Primary Endpoint		
mITT	0.84 (0.53-1.31)	0.44
Per Protocol	0.82 (0.52-1.30)	0.40
On-Treatment	0.79 (0.49-1.25)	0.31
All-Stroke/TIA	1.00 (0.40-2.51)	0.99
CV Death	0.75 (0.34-1.62)	0.46
Major + NMCR Bleeding		
All	0.81 (0.44-1.52)	0.51
Nonprocedural	0.53 (0.26-1.06)	0.07

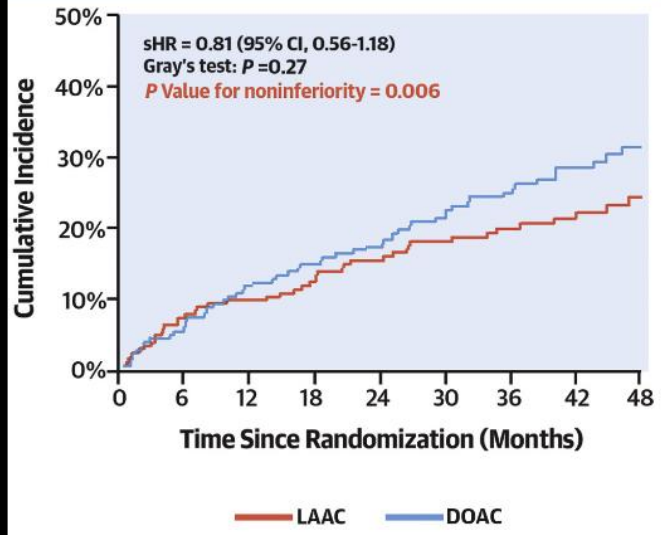
Osmancik et al. JACC 2020

PRAGUE-17 Trial: Long-Term (4-Year) Follow-Up

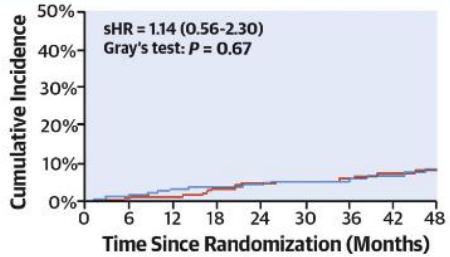
- 402 High-risk AF pts ➡ Randomized
  - CHA_2DS_2-VASc = 4.7 ± 1.5
  - HAS-BLED = 3.1 ± 0.9
- Median Follow-up: 3.5 years (IQR 2.6-4.3), 1,354 pt-year



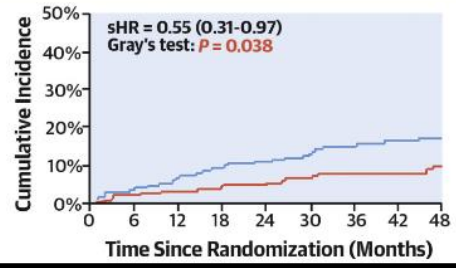
Primary Endpoint
Stroke, TIA, SE, CV Death, Bleeding or Complications



Stroke or TIA



Non-Procedural Clinically Relevant Bleeding



Osmancik et al. JACC 2022

Cors at the Shore 2023

When to Refer for LAA Closure?

JSCAI
The official journal of the Society for Cardiovascular Angiography & Interventions

Standards and Guidelines

SCAI/HRS Expert Consensus Statement on Transcatheter Left Atrial Appendage Closure

Check for updates

Patient Selection for LAAC

1. Transcatheter LAAC is appropriate for patients with nonvalvular AF with high thromboembolic risk who are not suited for long-term OAC and who have adequate life expectancy (minimum >1 year) and quality of life to benefit from LAAC. There should be patient-provider discussion for shared decision making

Table 2. 2019 AHA/ACC/HRS focused update of the 2014 AHA/ACC/HRS guideline for the management of patients with atrial fibrillation.

Recommendations	Class of recommendation	Level of evidence
After surgical occlusion or exclusion of the LAA, it is recommended to continue anticoagulation in at-risk patients with AF for stroke prevention.	I	B
LAA occlusion may be considered for stroke prevention in patients with AF and contraindications for long-term anticoagulant treatment (eg, those with a previous life-threatening bleed without reversible cause).	IIb	B
Surgical occlusion or exclusion of the LAA may be considered for stroke prevention in patients with AF undergoing cardiac surgery.	IIb	B
Surgical occlusion or exclusion of the LAA may be considered for stroke prevention in patients undergoing thoracoscopic AF surgery.	IIb	B

Table 3. 2020 European Society of Cardiology Guidelines for the management of atrial fibrillation.

Recommendations for occlusion or exclusion of the LAA	Class of recommendation	Level of evidence
LAA occlusion may be considered for stroke prevention in patients with AF and contraindications for long-term anticoagulant treatment (eg, intracranial bleeding without a reversible cause)	IIb	B
Surgical occlusion or exclusion of the LAA may be considered for stroke prevention in patients with AF undergoing cardiac surgery	IIb	C

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THANK YOU!

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