Ablative therapy for AF

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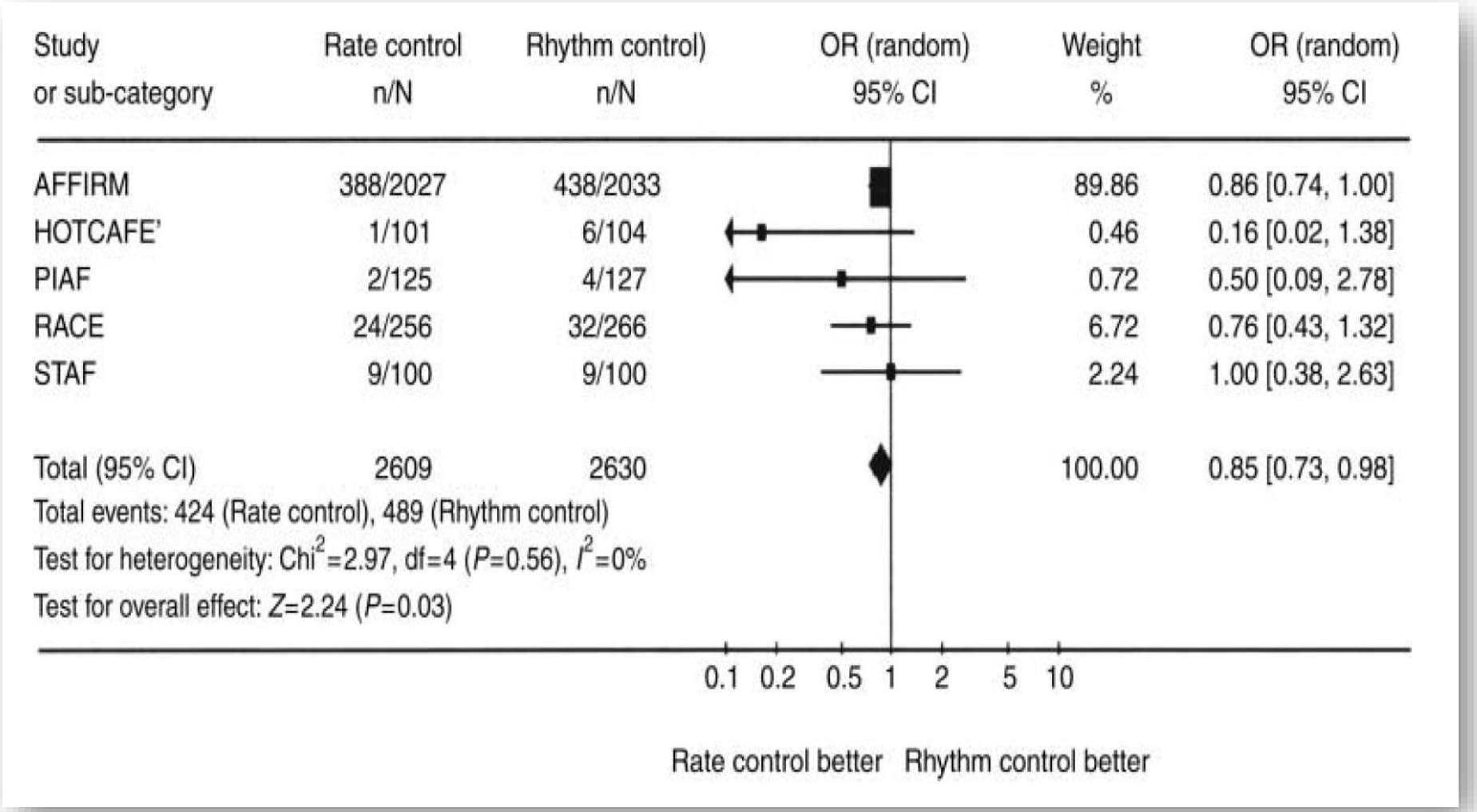
Objectives

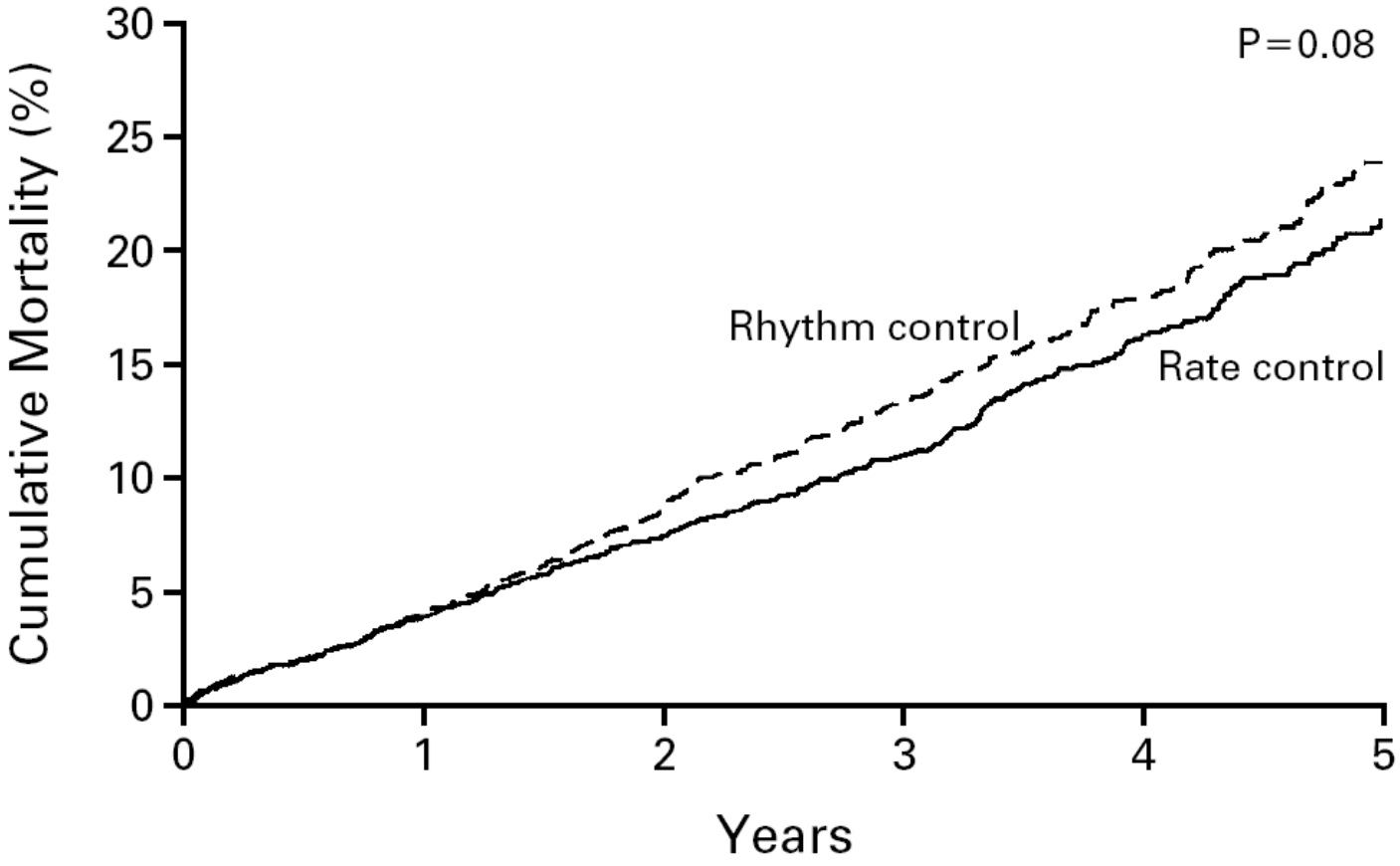
- Why we target the pulmonary veins ?
- who benefits the most ?
- when it should be offered ?

Rate Control vs Rhythm Control



Testa EHJ 2005

AFFIRM



No. of Deaths		number (percent)				
Rhythm control	0	80 (4)	175 (9)	257 (13)	314 (18)	352 (24)
Rate control	0	78 (4)	148 (7)	210 (11)	275 (16)	306 (21)

AFFIRM Investigators NEJM 2002

Sinus Rhythm and Survival in AFFIRM

Covariate	HR (99 % C.I.)	P
Sinus		001
Rhy		05

“If an effective method for maintaining sinus rhythm with fewer adverse effects were available, it might be beneficial”

Adjusted for age, CAD, CHF, Diabetes, CVA/TIA, first episode of AF, Warfarin and Digoxin use.

Corley Circulation 2004

PV Triggers 1998

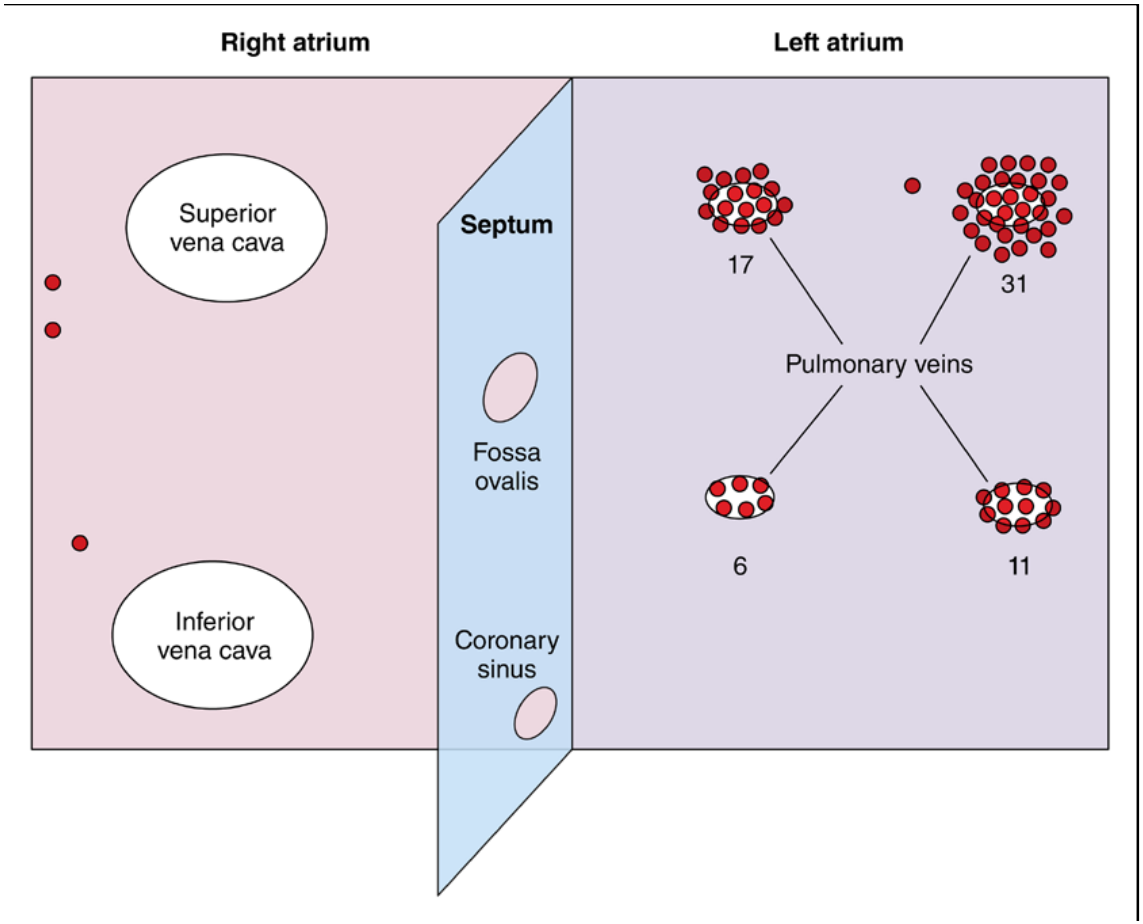
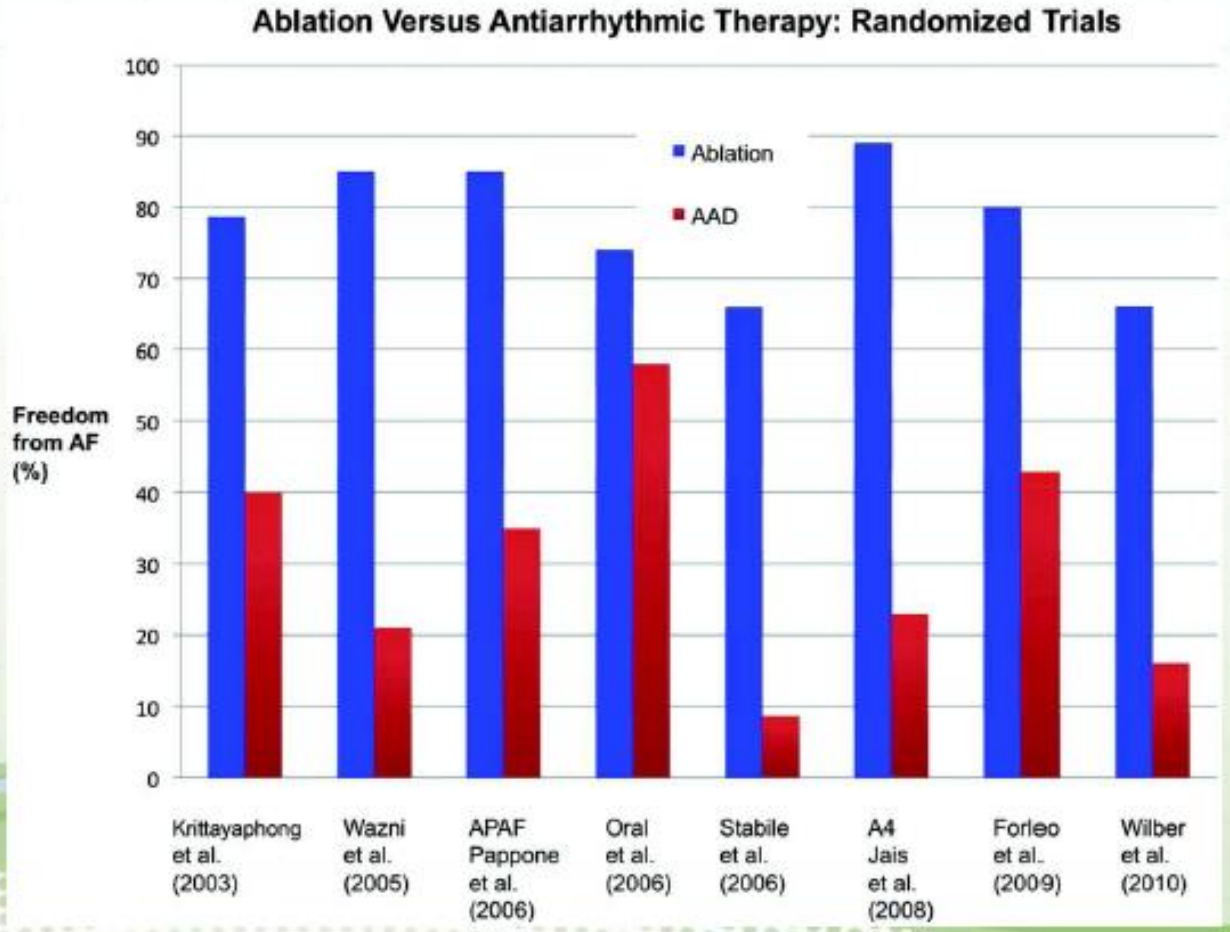


Figure 1. Locations of atrial tachycardia that initiated atrial fibrillation in 45 patients reported in 1998.
Note that the majority of focal atrial tachycardias that precipitated atrial fibrillation lie within the pulmonary veins. Adapted with permission from Haïssaguerre et al[5] with permission from the publisher. Copyright © 1998 Massachusetts Medical Society.

Summary of randomized control trials comparing catheter ablation versus antiarrhythmic therapy.



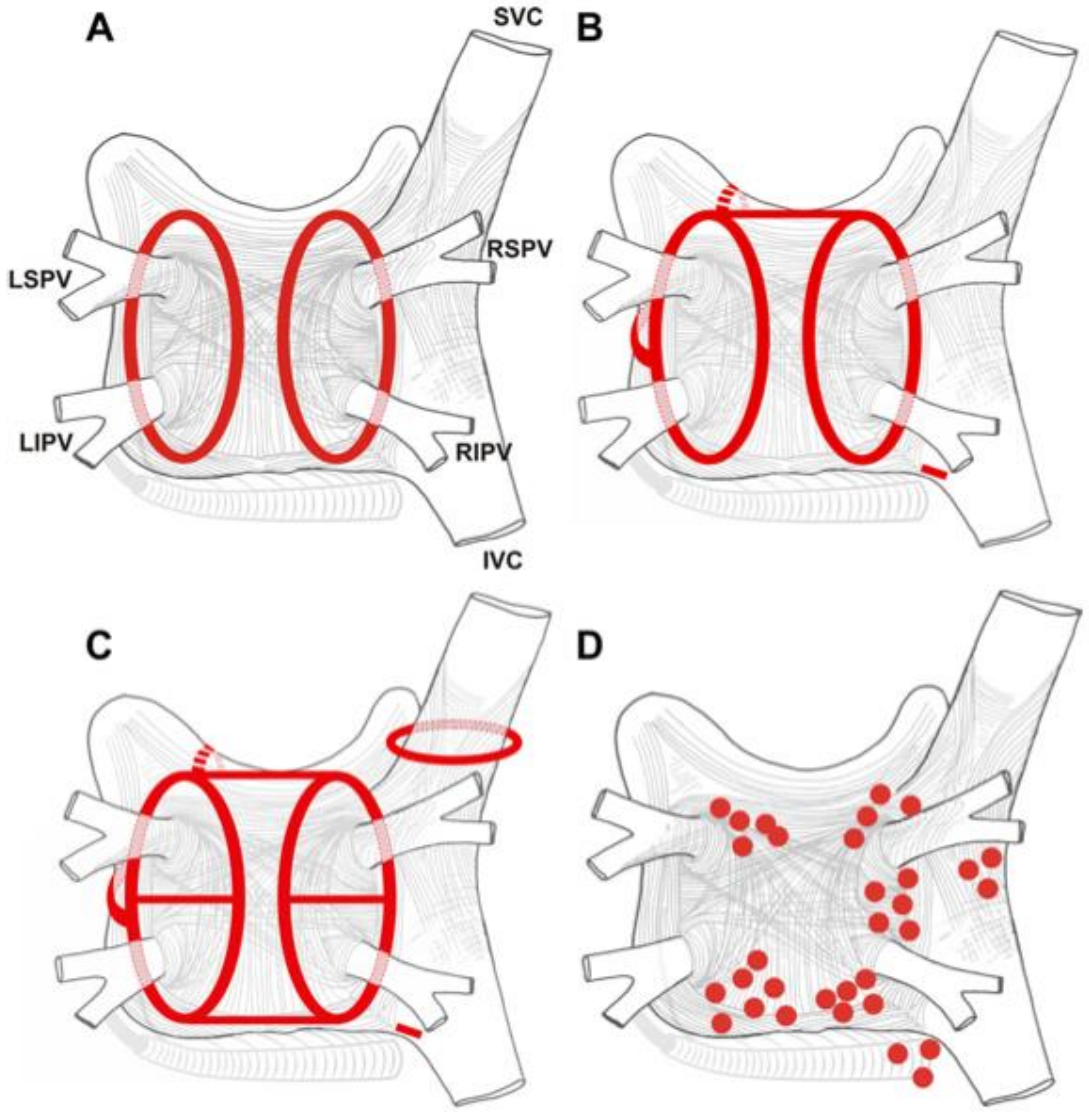
North Shore LIJ

American Heart Association.

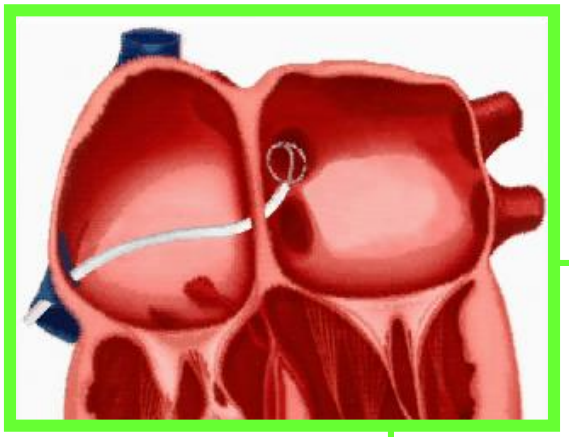
Roderick Tung et al. Circulation. 2012;126:223-229

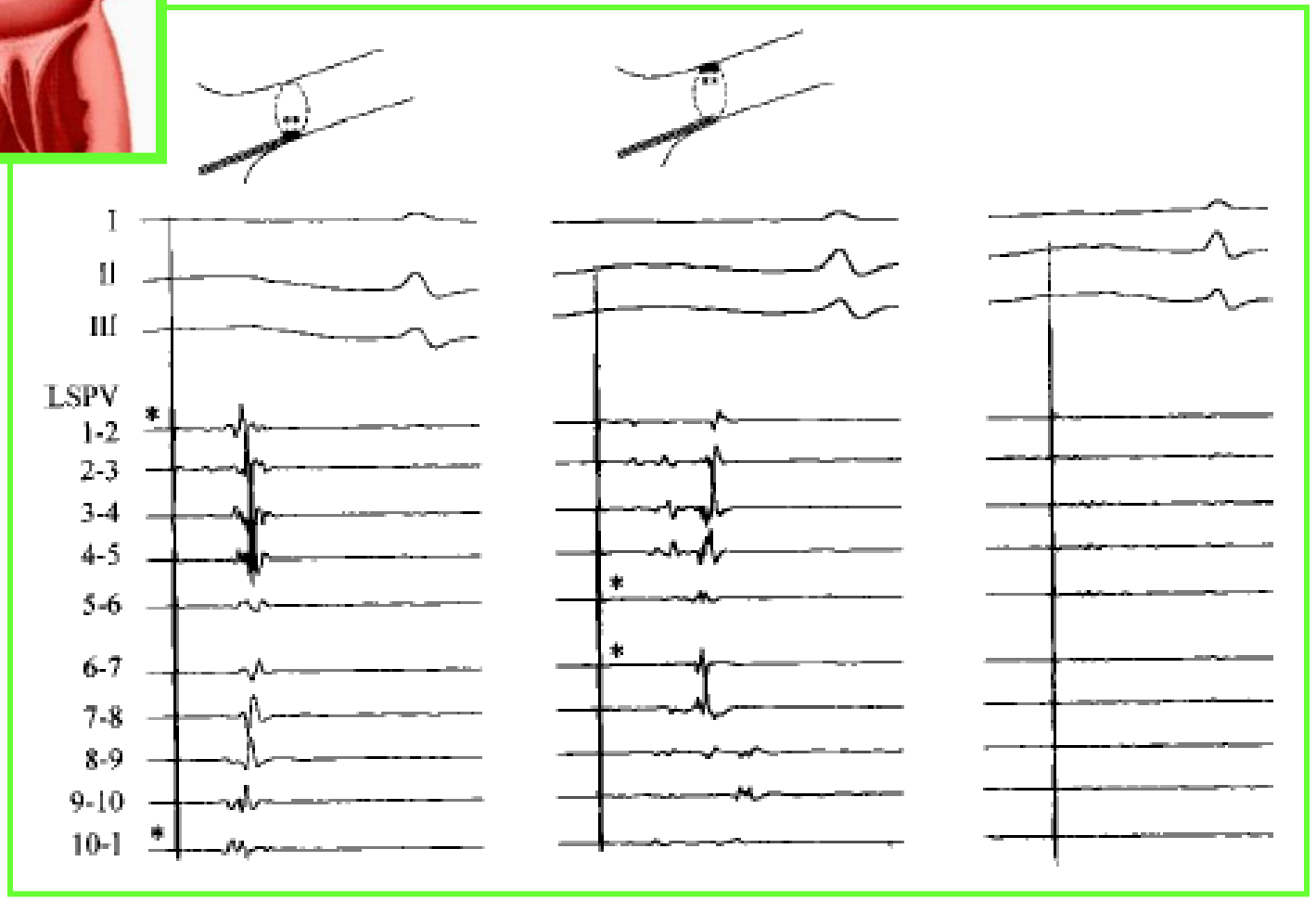
What would be your strategy?

A. PVI only
B. PVI+ lines
C. PVI+ SVC
D. Rotor ablation



Pulmonary Vein Isolation





Going…

Going…

Gone !

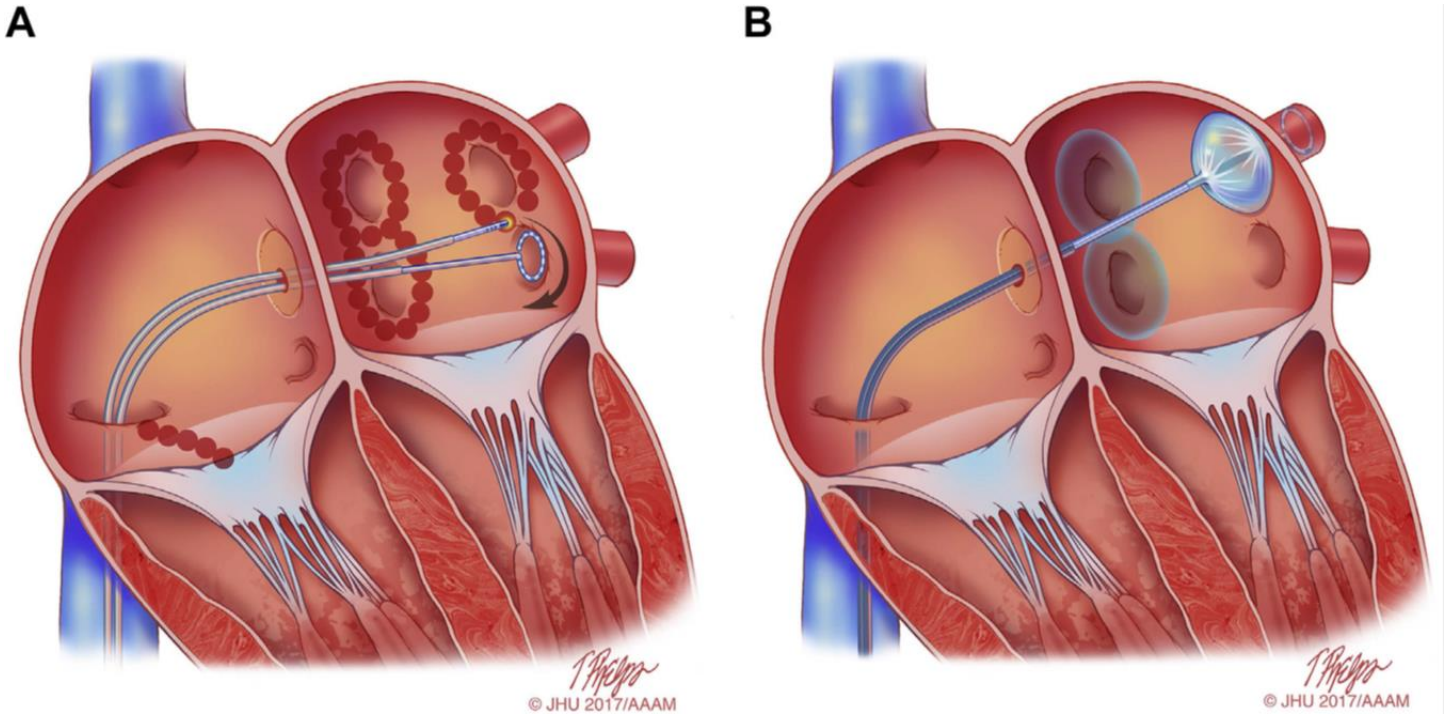
Haïssaguerre, M. et al., Circulation. 2000;102:2463–2465.

Strategy

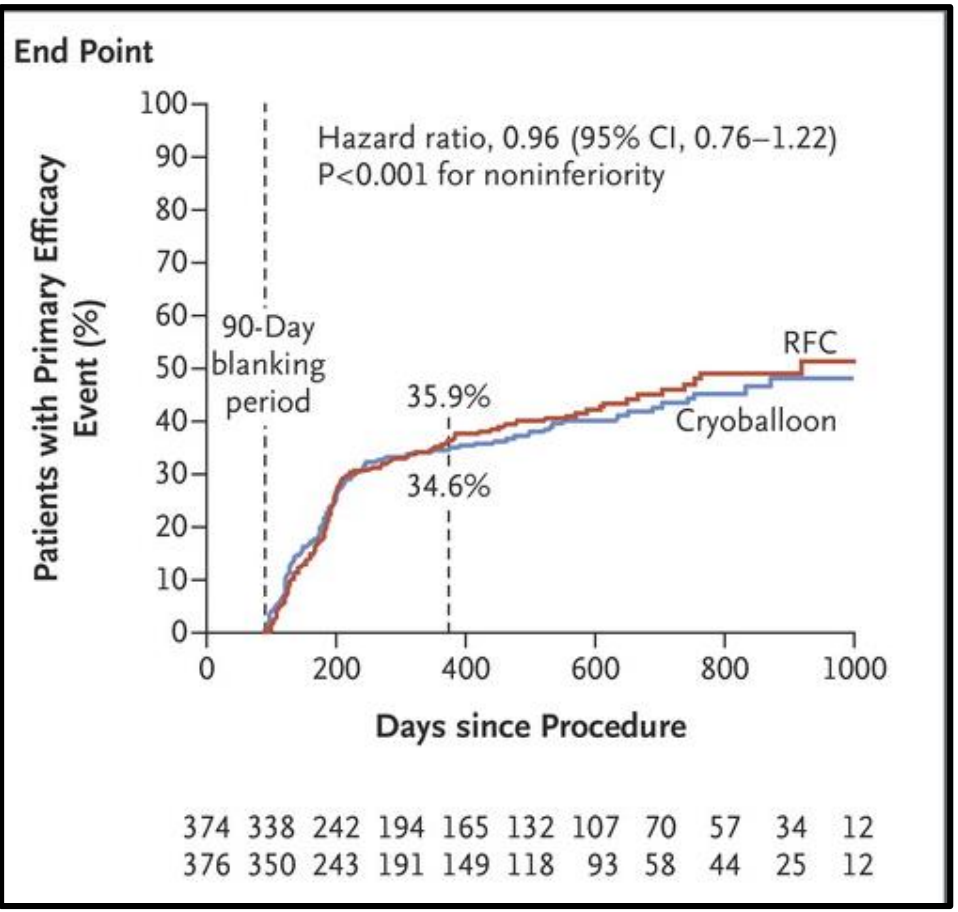
Table 3 Atrial fibrillation ablation: strategies, techniques, and endpoints

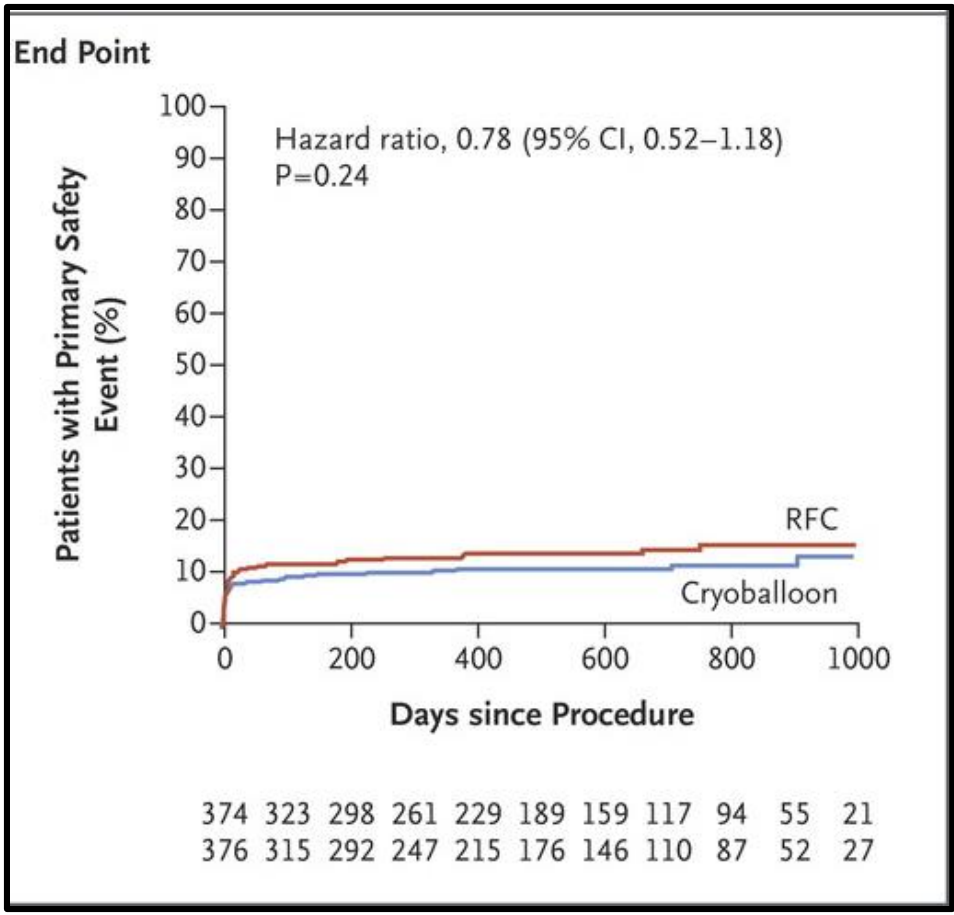
	Recommendation	Class	LOE	References
PV isolation by catheter ablation	Electrical isolation of the PVs is recommended during all AF ablation procedures.	I	A	245,261,262,456,462,489,503,515,527, 655,673,684,709,733,1015,1025,1026, 1027,1030
	Achievement of electrical isolation requires, at a minimum, assessment and demonstration of entrance block into the PV.	I	B-R	245,261,262,456,462,489,503,515,527, 655,673,684,709,733,1015,1025,1026, 1027,1030
	Monitoring for PV reconnection for 20 minutes following initial PV isolation is reasonable.	IIa	B-R	263,265,448,450,451,452,457–461,462
	Administration of adenosine 20 minutes following initial PV isolation using RF energy with reablation if PV reconnection might be considered.	IIb	B-R	265,448,449–451,454,456,461,463–468
	Use of a pace-capture (pacing along the ablation line) ablation strategy may be considered.	IIb	B-R	264,472–475
				445,477–481

If you refer for ablation, RF or Cryo?



Fire and Ice



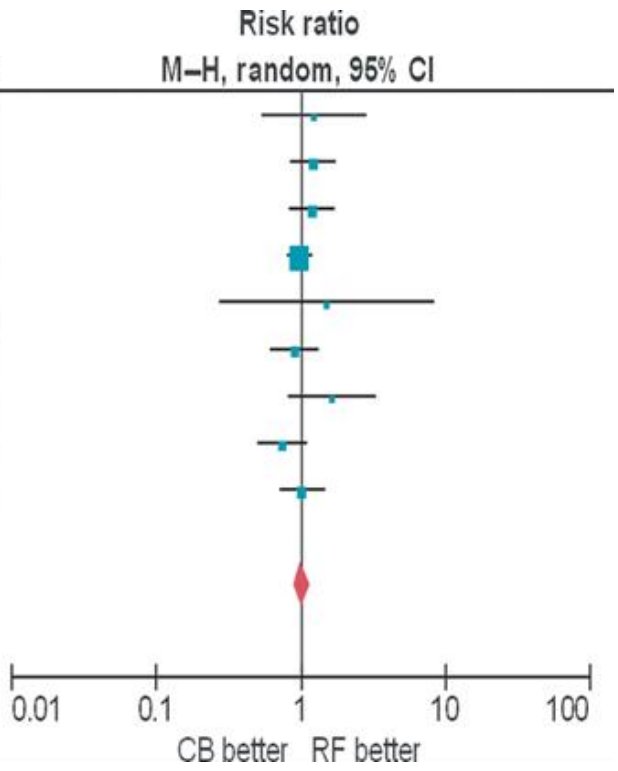


N Engl J Med 2016; 374:2235-224

Study or subgroup	CB Events	CB Total	RF Events	RF Total	Weight	Risk ratio M–H, random, 95% CI
Jourda et al, 2015	11	75	9	75	2.1%	1.22 [0.54, 2.78]
Khoueiry et al, 2016	53	311	53	376	11.3%	1.21 [0.85, 1.72]
Knecht et al, 2014	37	71	31	71	11.6%	1.19 [0.84, 1.69]
Kuck et al, 2016	138	374	143	376	40.5%	0.97 [0.81, 1.17]
Kuehne et al, 2010	3	25	2	25	0.5%	1.50 [0.27, 8.22]
Luik et al, 2015	38	144	43	147	10.1%	0.90 [0.62, 1.31]
Perez-Castellano et al, 2014	13	25	8	25	3.0%	1.63 [0.82, 3.22]
Straube et al, 2015	31	107	39	99	9.4%	0.74 [0.50, 1.08]
Wasserlauf et al, 2015	40	101	39	100	11.7%	1.02 [0.72, 1.43]
Total (95% CI)		**1233**		**1294**	**100.0%**	**1.01 [0.90, 1.14]**
Total events	364		367			

Heterogeneity: $\tau^2 = 0.00$; $\chi^2 = 7.34$, df = 8 ($P = 0.50$); $I^2 = 0\%$

Test for overall effect: $Z = 0.21$ ($P = 0.83$)



***EP Europace*, 2016, (19): 3, 378–384**

AF Ablation: For Which Patients?

- **Randomized Clinical Trials**
  - Mostly white men ~ 50-60 years with paroxysmal AF
  - Compared ablation to antiarrhythmics (or rate control)
  - Ablation better in keeping sinus rhythm 66-87% *vs. 9-58%*

- **Nonrandomized Comparisons**
  - Similar to above – mostly paroxysmal AF
  - AF ablation success at keeping sinus rhythm (typically at 1 year):
    - Single procedure/Off AADs = 57% (95% CI 50%-64%)
    - Multiple procedure/Off AADs = 71% (95% CI 65%-77%)
    - Multiple procedure/On AADs = 77% (95% 73%-81%)
  - Fewer studies in non-Paroxysmal AF – success rate 47%

2012 HRS/EHRA/ECAS Expert Consensus Statement on Catheter and Surgical Ablation of Atrial Fibrillation

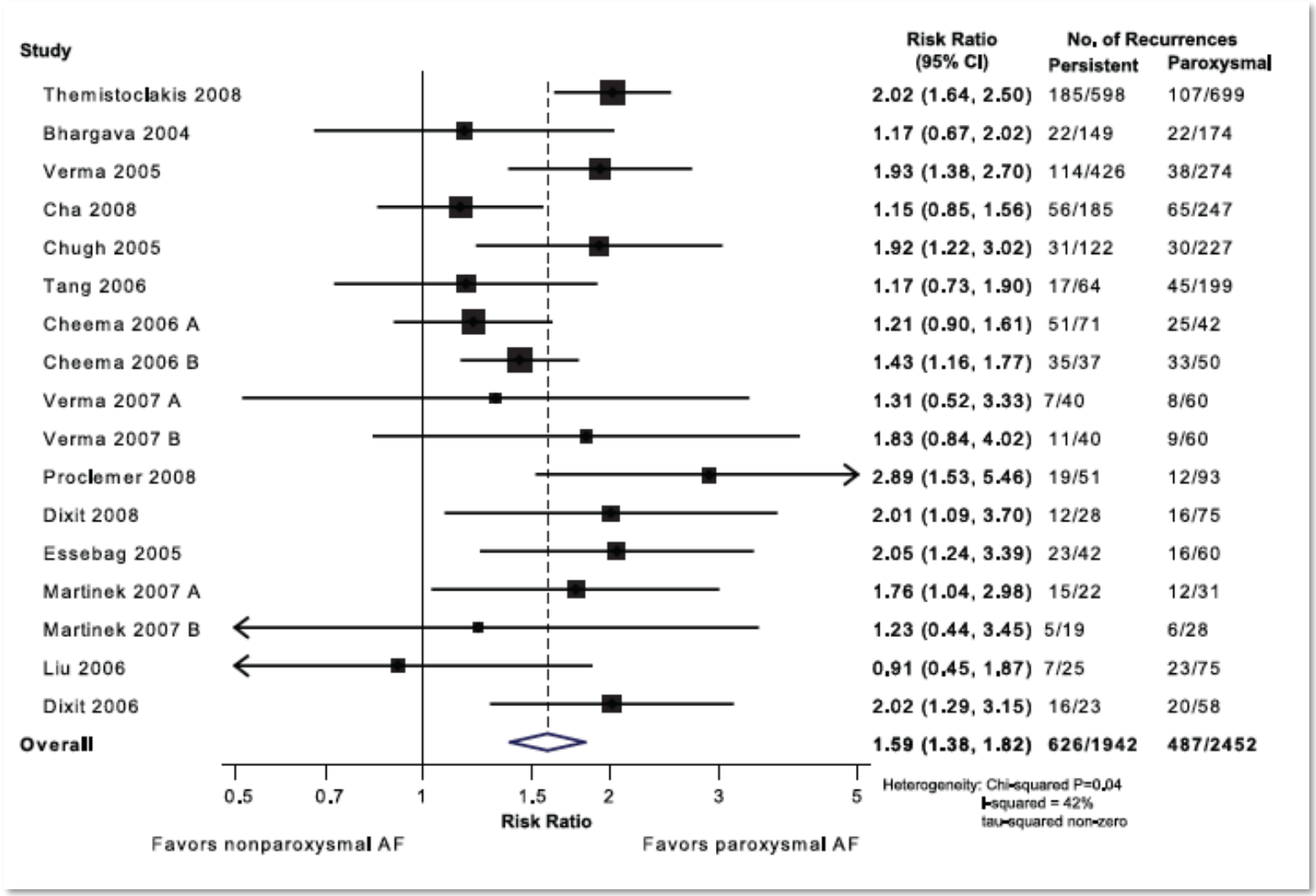
Can we pick the right patient?

- Systematic review characteristics associated with success of AF ablation (45 studies, median follow up 12 months).

Variable	Studies (n)	Significant Association
AF Type	17	6
LVEF	17	5
LA Diameter	20	4
Structural Heart Disease	21	2
AF Symptom Duration	16	3
Age	22	1
Gender	23	0
Hypertension	11	2

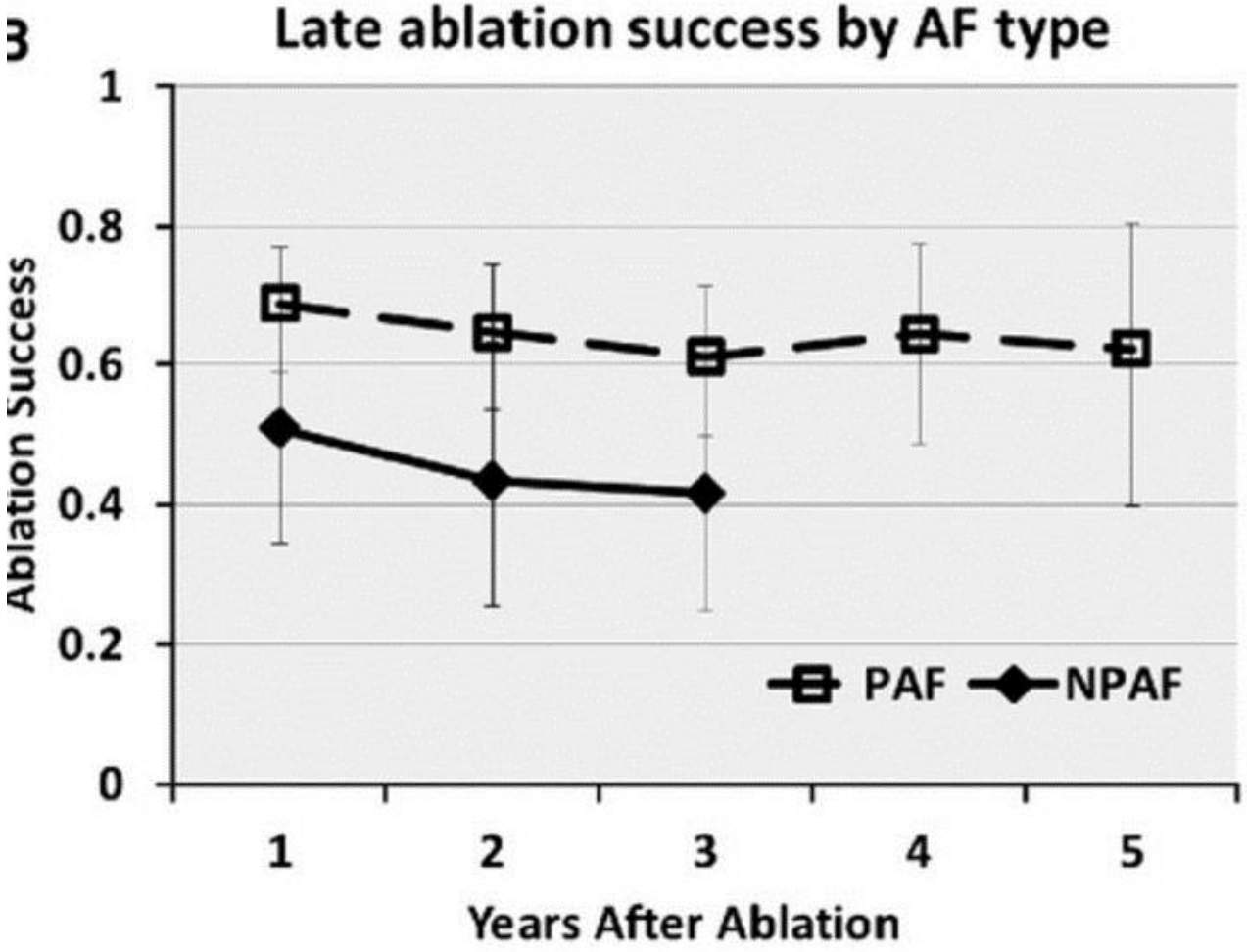
Balk JCE 2010

Can we pick the right patient?



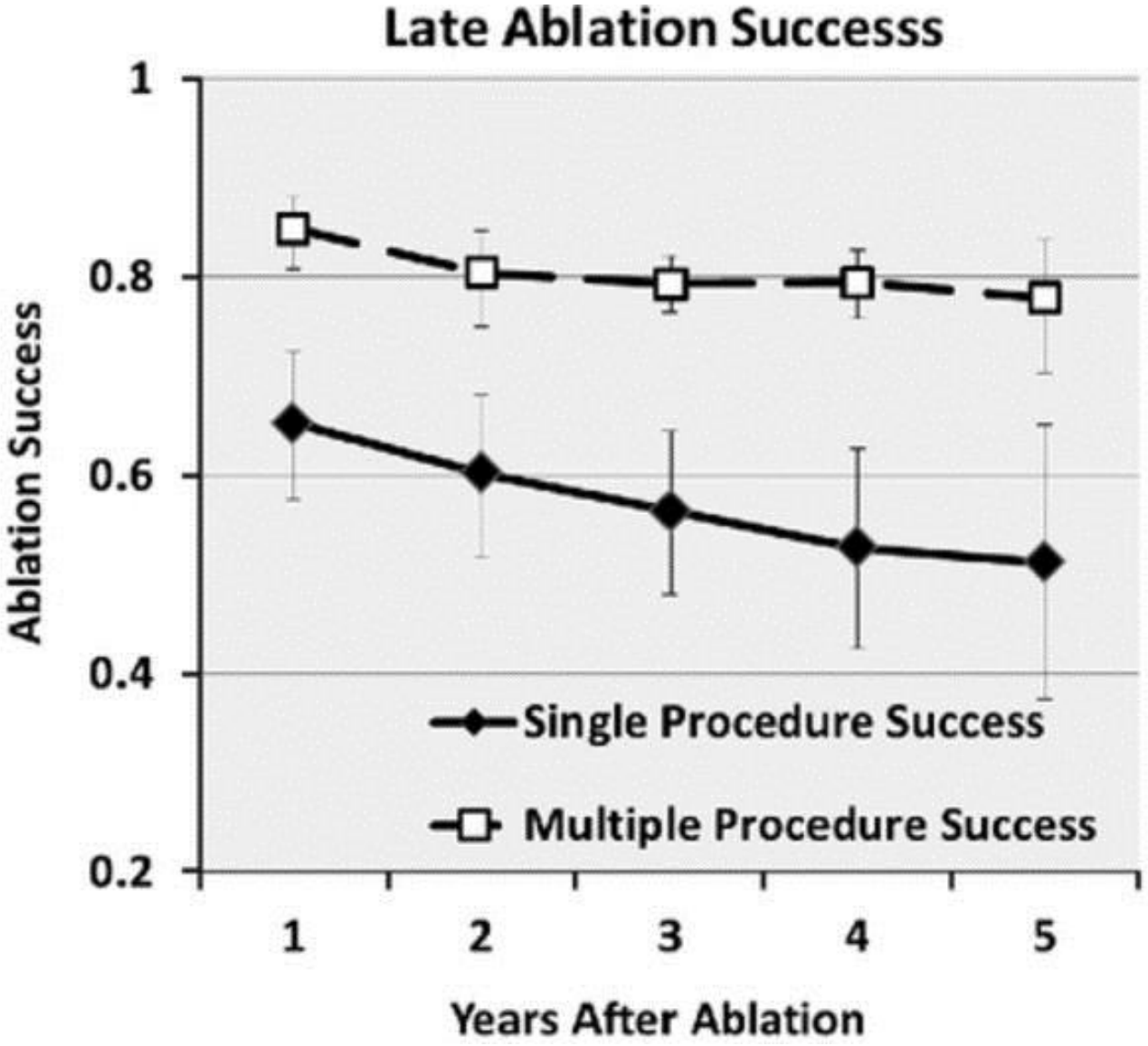
Balk JCE 2010

Long-term Outcomes of AF Ablation



Ganesan et al , J Am Heart Assoc. 2013

Long-term Outcomes of AF Ablation



Ganesan et al , J Am Heart Assoc. 2013

What do the guidelines say?

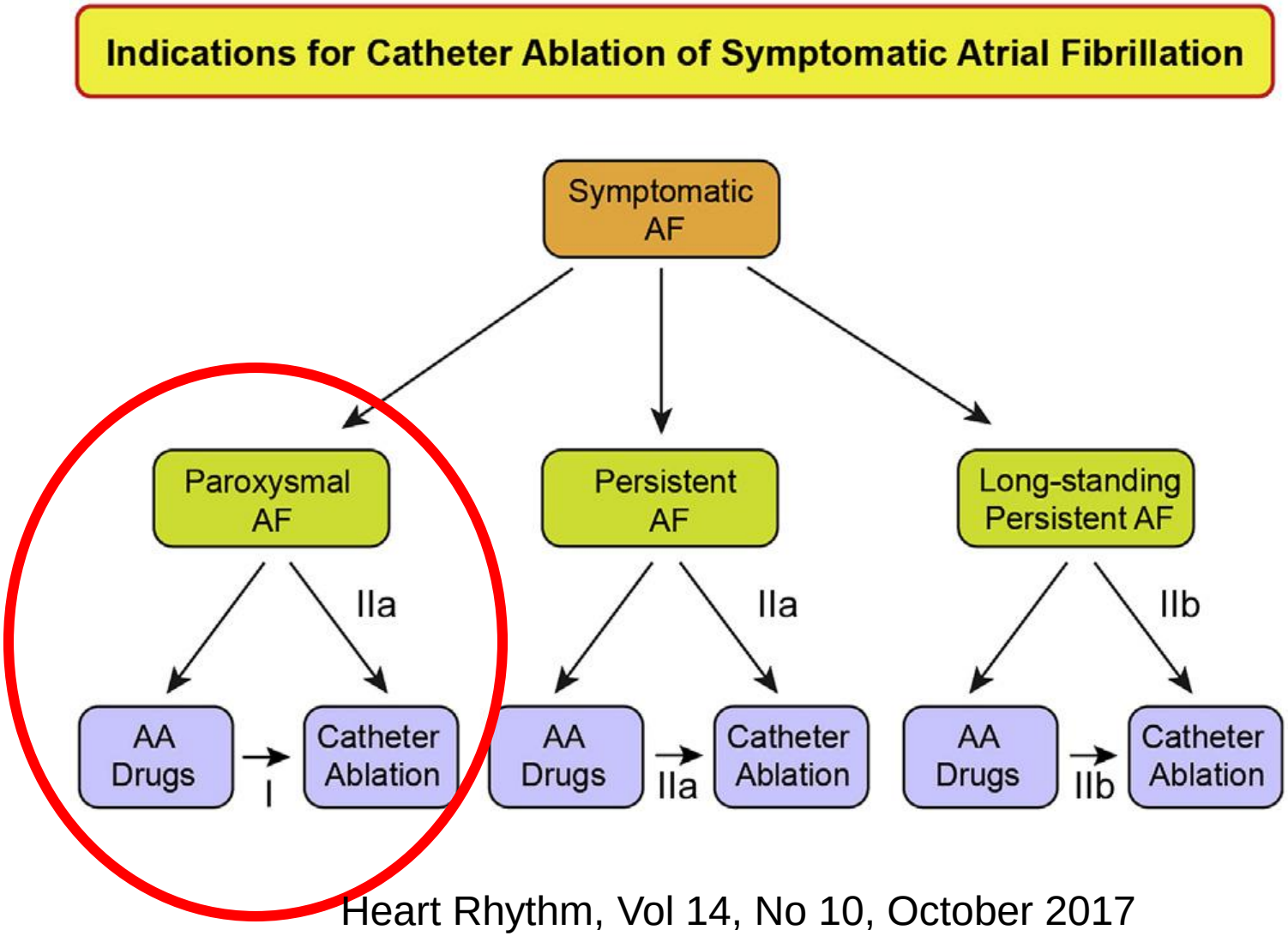
ESTIMATE OF CERTAINTY (PRECISION) OF TREATMENT EFFECT	SIZE OF TREATMENT EFFECT			
	CLASS I *Benefit >>> Risk* Procedure/Treatment **SHOULD** be performed/ administered	**CLASS IIa** *Benefit >> Risk* *Additional studies with focused objectives needed* **IT IS REASONABLE** to perform procedure/administer treatment	**CLASS IIb** *Benefit ≥ Risk* *Additional studies with broad objectives needed; additional registry data would be helpful* Procedure/Treatment **MAY BE CONSIDERED**	**CLASS III** *No Benefit* or **CLASS III** *Harm* Procedure/Test / Treatment COR III: No benefit — Not Helpful / No Proven Benefit COR III: Harm — Excess Cost w/o Benefit or Harmful / Harmful to Patients
LEVEL A Multiple populations evaluated* Data derived from multiple randomized clinical trials or meta-analyses	■ Recommendation that procedure or treatment is useful/effective ■ Sufficient evidence from multiple randomized trials or meta-analyses	■ Recommendation in favor of treatment or procedure being useful/effective ■ Some conflicting evidence from multiple randomized trials or meta-analyses	■ Recommendation's usefulness/efficacy less well established ■ Greater conflicting evidence from multiple randomized trials or meta-analyses	■ Recommendation that procedure or treatment is not useful/effective and may be harmful ■ Sufficient evidence from multiple randomized trials or meta-analyses
LEVEL B Limited populations evaluated* Data derived from a single randomized trial or nonrandomized studies	■ Recommendation that procedure or treatment is useful/effective ■ Evidence from single randomized trial or nonrandomized studies	■ Recommendation in favor of treatment or procedure being useful/effective ■ Some conflicting evidence from single randomized trial or nonrandomized studies	■ Recommendation's usefulness/efficacy less well established ■ Greater conflicting evidence from single randomized trial or nonrandomized studies	■ Recommendation that procedure or treatment is not useful/effective and may be harmful ■ Evidence from single randomized trial or nonrandomized studies
LEVEL C Very limited populations evaluated* Only consensus opinion of experts, case studies, or standard of care	■ Recommendation that procedure or treatment is useful/effective ■ Only expert opinion, case studies, or standard of care	■ Recommendation in favor of treatment or procedure being useful/effective ■ Only diverging expert opinion, case studies, or standard of care	■ Recommendation's usefulness/efficacy less well established ■ Only diverging expert opinion, case studies, or standard of care	■ Recommendation that procedure or treatment is not useful/effective and may be harmful ■ Only expert opinion, case studies, or standard of care

What do the guidelines say?

- Prior to consideration of AF catheter ablation, assessment of the procedural risks and outcomes relative to the individual patient is recommended (Class I, Level of Evidence C).
- AF catheter ablation **should not** be performed in patients who cannot be treated with anticoagulant therapy during or following the procedure (Class III-Harm, Level of Evidence C).
- AF catheter ablation to restore sinus rhythm **should not** be performed with the sole intent of obviating the need for anticoagulation (Class III-Harm, Level of Evidence C).

2014 ACC/AHA/HRS Atrial Fibrillation Guidelines

Guidelines 2017



Heart Rhythm, Vol 14, No 10, October 2017

Take Home Messages

- AF catheter ablation is more effective in maintaining sinus rhythm than drugs
  - RCT evidence predominantly in paroxysmal AF
  - Improves quality of life in symptomatic patients
  - Little or no evidence in harder clinical endpoints
- The symptomatic paroxysmal AF patient with limited or no comorbidities appears to be the best candidate.

Thank you