Ablation for Paroxysmal Atrial Fibrillation: Who, How, and When ?

Outline

1. Overview of AF Ablation for Paroxysmal AF
2. Who to Ablate?
3. How to Ablate ?
4. When to Ablate
5. Conclusion

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Conflicts of Interest

- Consultant Medtronic, Atricure, Abbot Medical, St Jude
- Research Support: Boston Scientific, St Jude Medical

Overview of AF Ablation for Paroxysmal AF

1998

The New England Journal of Medicine

Established in 1812 as The New England Journal of Medicine and Surgery

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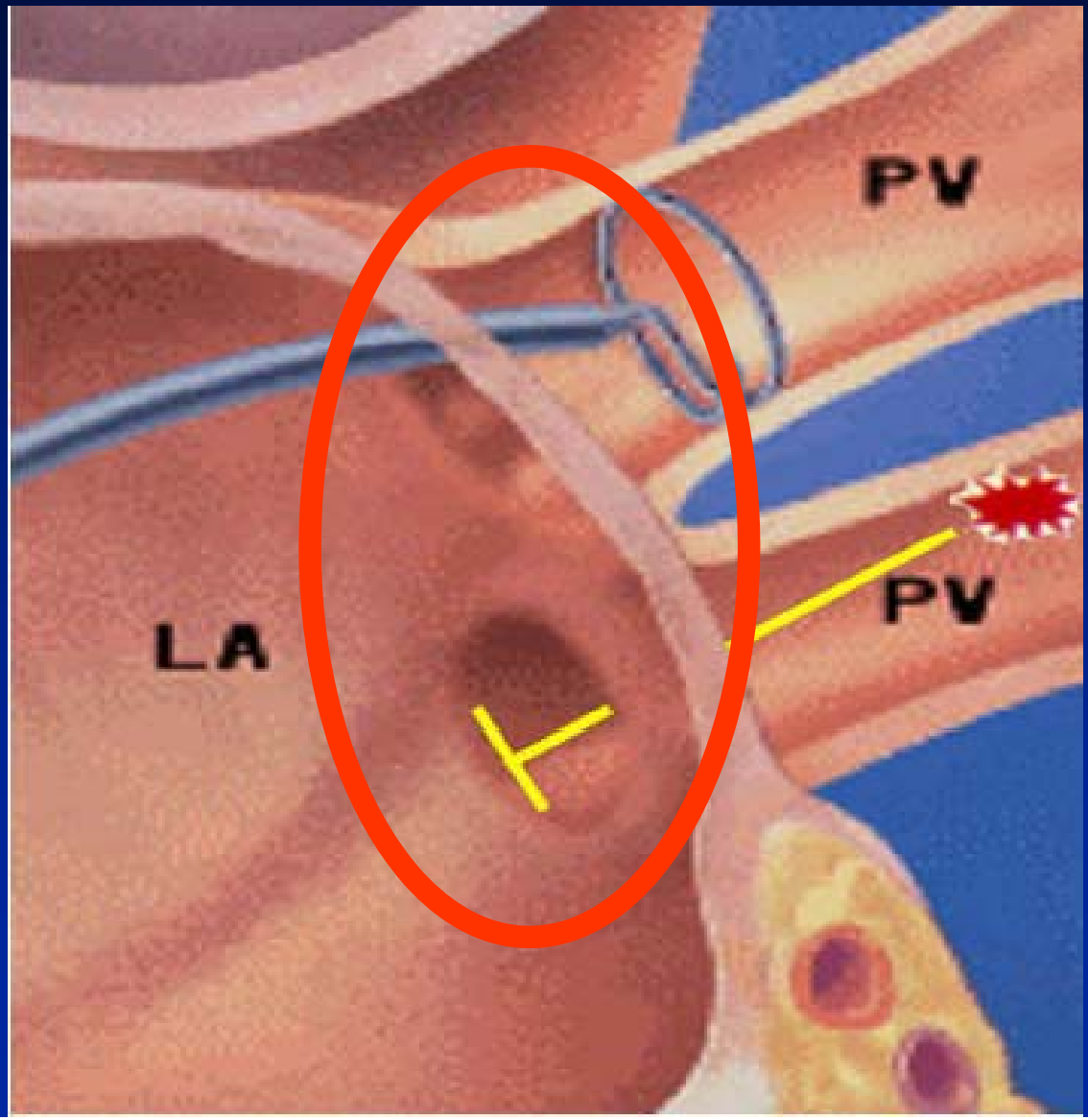
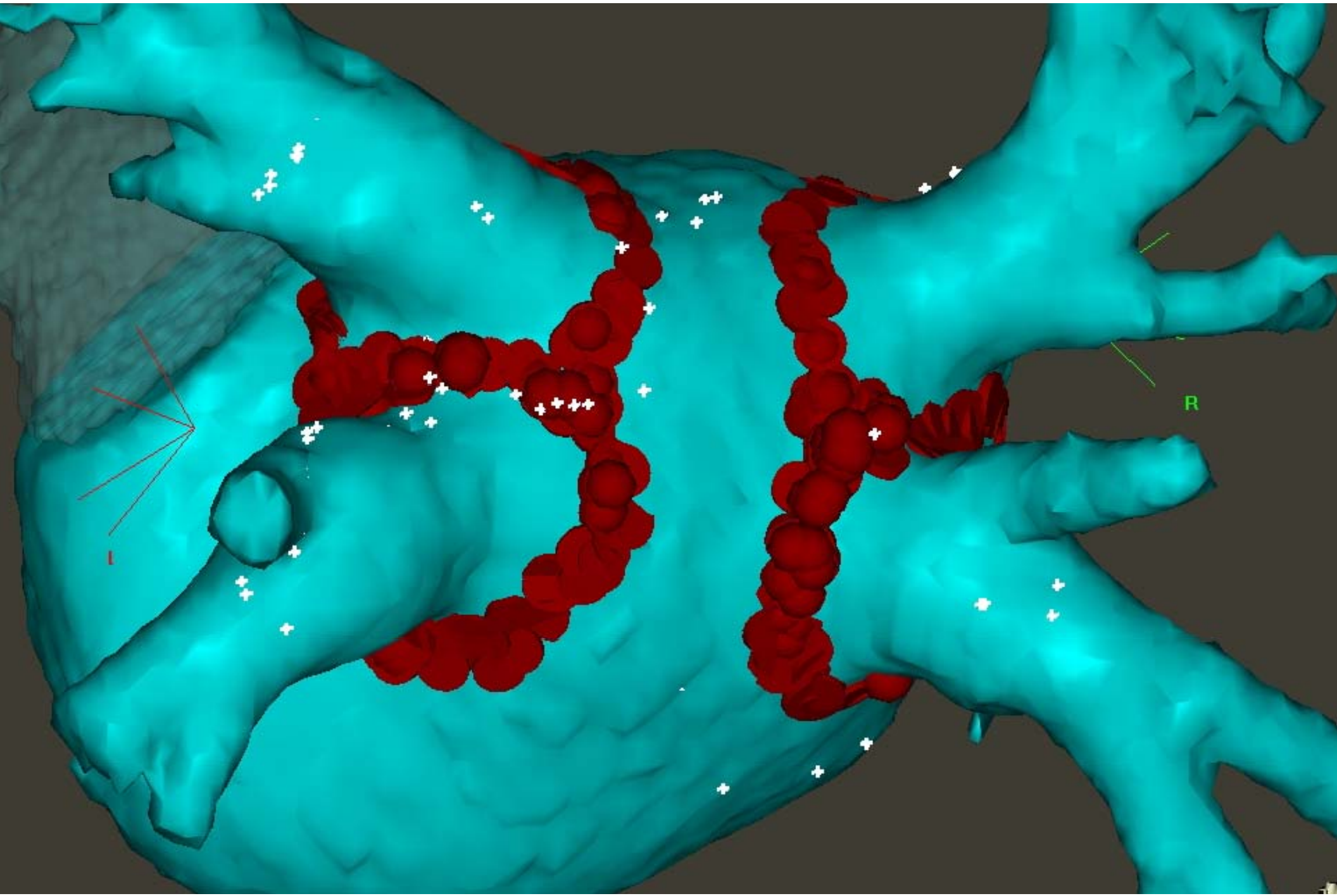
We Have Learned a Lot about Ablation of Paroxysmal Atrial Fibrillation

- How to perform it.
- How to avoid PV stenosis and phrenic nerve injury.
- How to avoid esophageal injury.
- How to lower stroke risk with aggressive anticoagulation.
- Results in elimination of symptomatic AF in most patients.
- Improves quality of life.
- More effective than antiarrhythmic drug therapy.
- Associated with low but real risk of major complications.

Circumferential Ablation with PV Isolation

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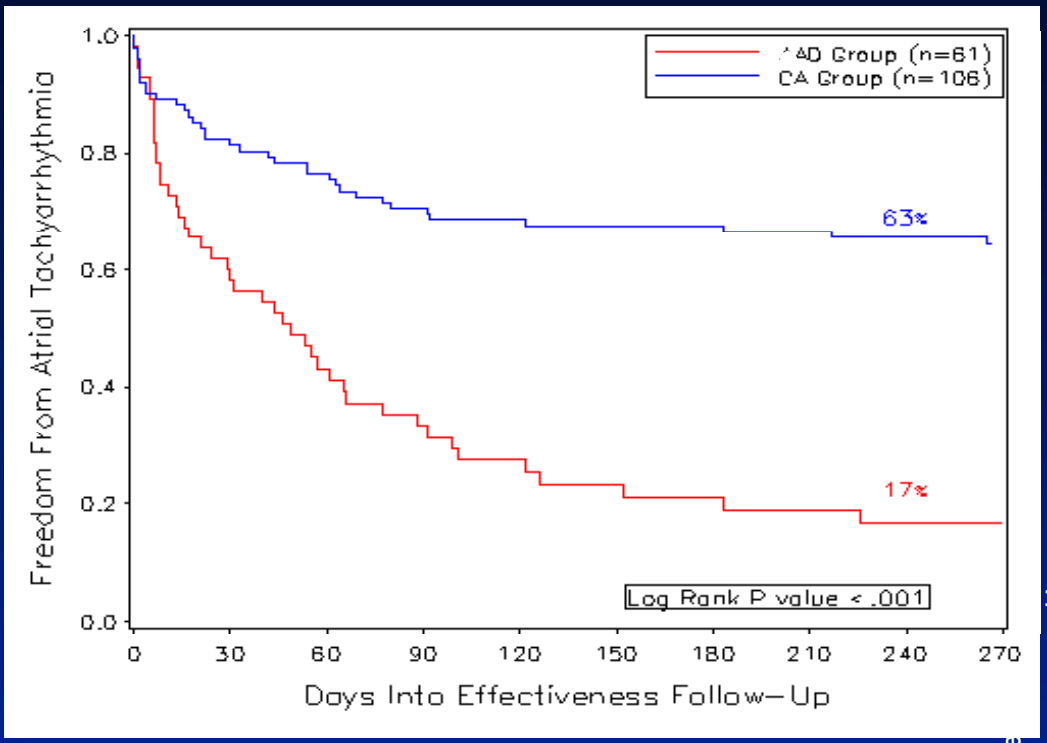
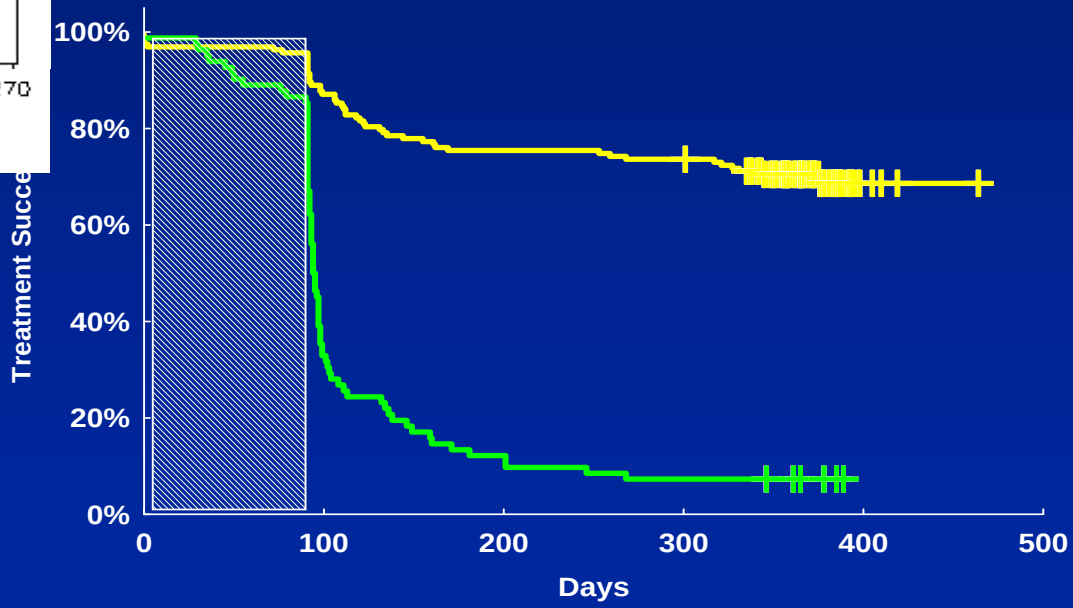
I

NAVISTAR® THERMOCOOL® Trial

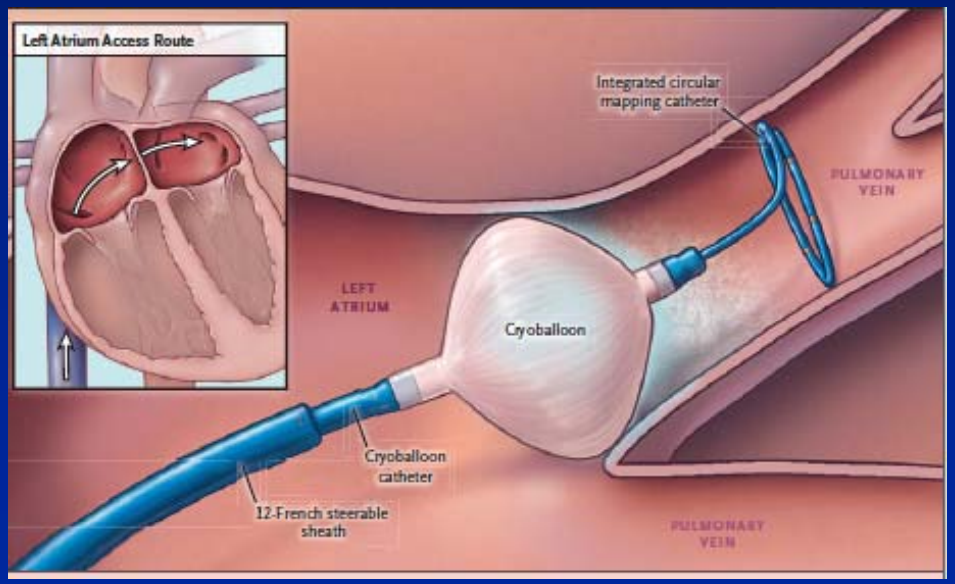


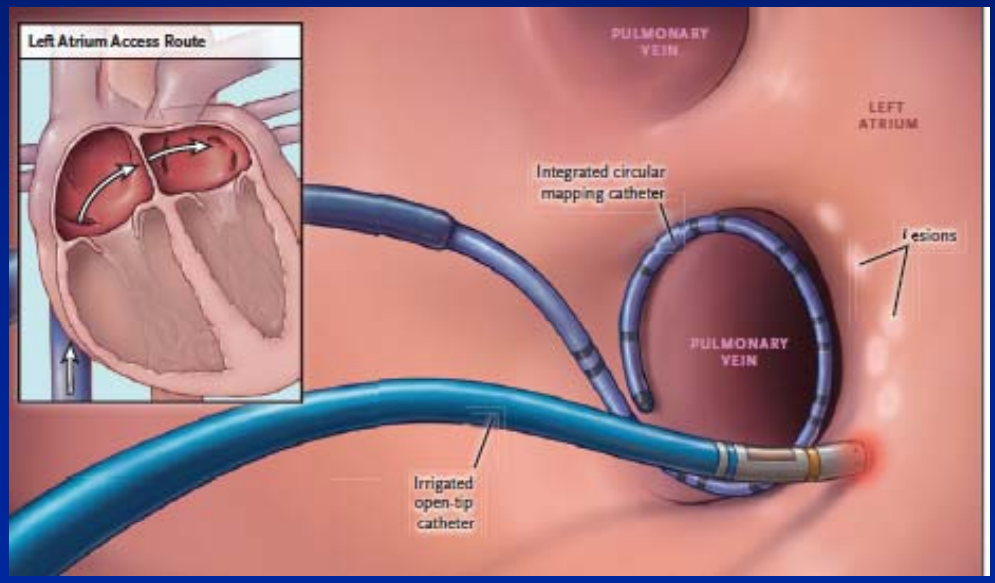
Cryoballoon Trial



Cryoballoon or Radiofrequency Ablation for Paroxysmal Atrial Fibrillation

Karl-Heinz Kuck, M.D., Josep Brugada, M.D., Alexander Fürnkranz, M.D., Andreas Metzner, M.D., Feifan Ouyang, M.D., K.R. Julian Chun, M.D., Arif Elvan, M.D., Ph.D, Thomas Arentz, M.D., Kurt Bestehorn, M.D., Stuart J. Pocock, Ph.D., Jean-Paul Albenque, M.D., Ph.D., and Claudio Tondo, M.D., Ph.D., for the FIRE AND ICE Investigators*





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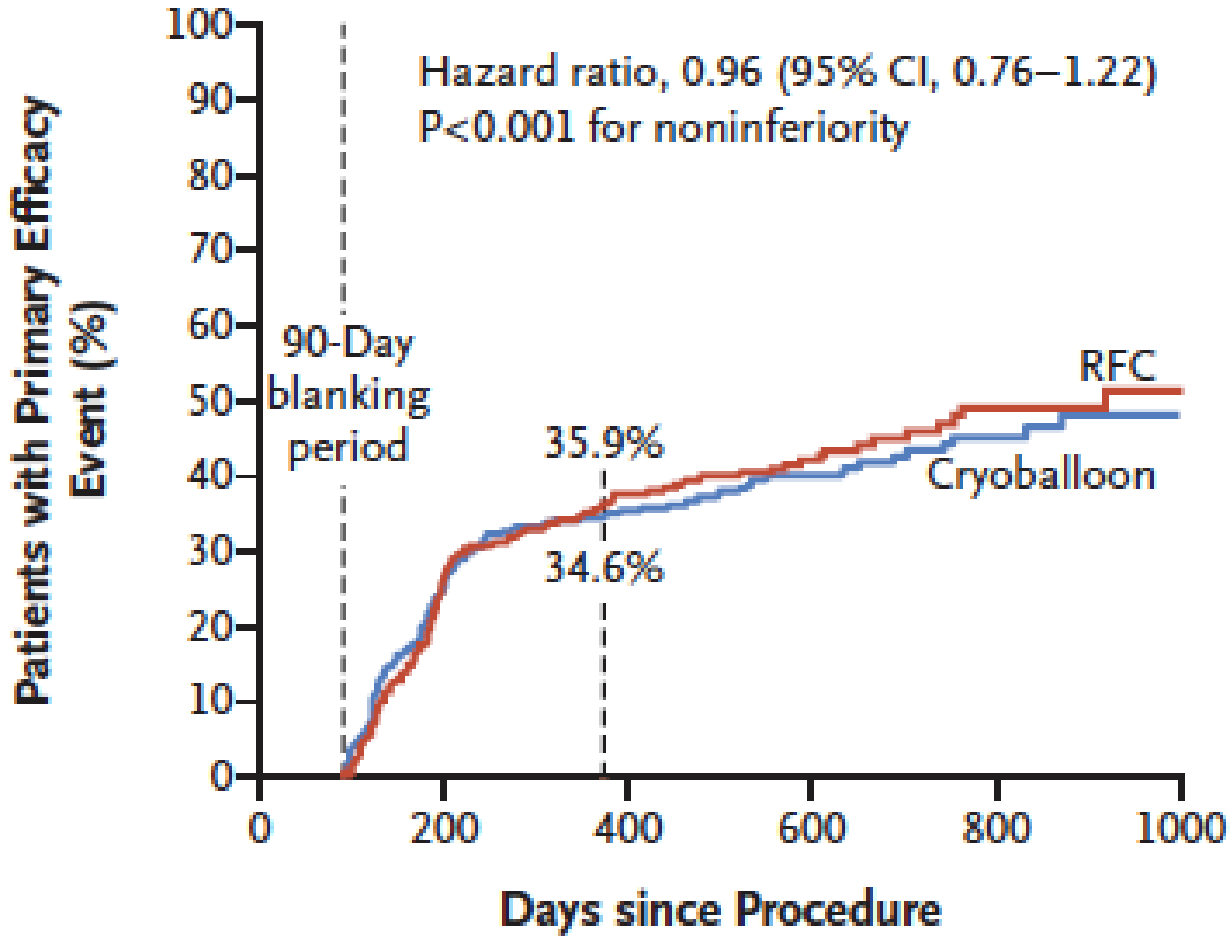
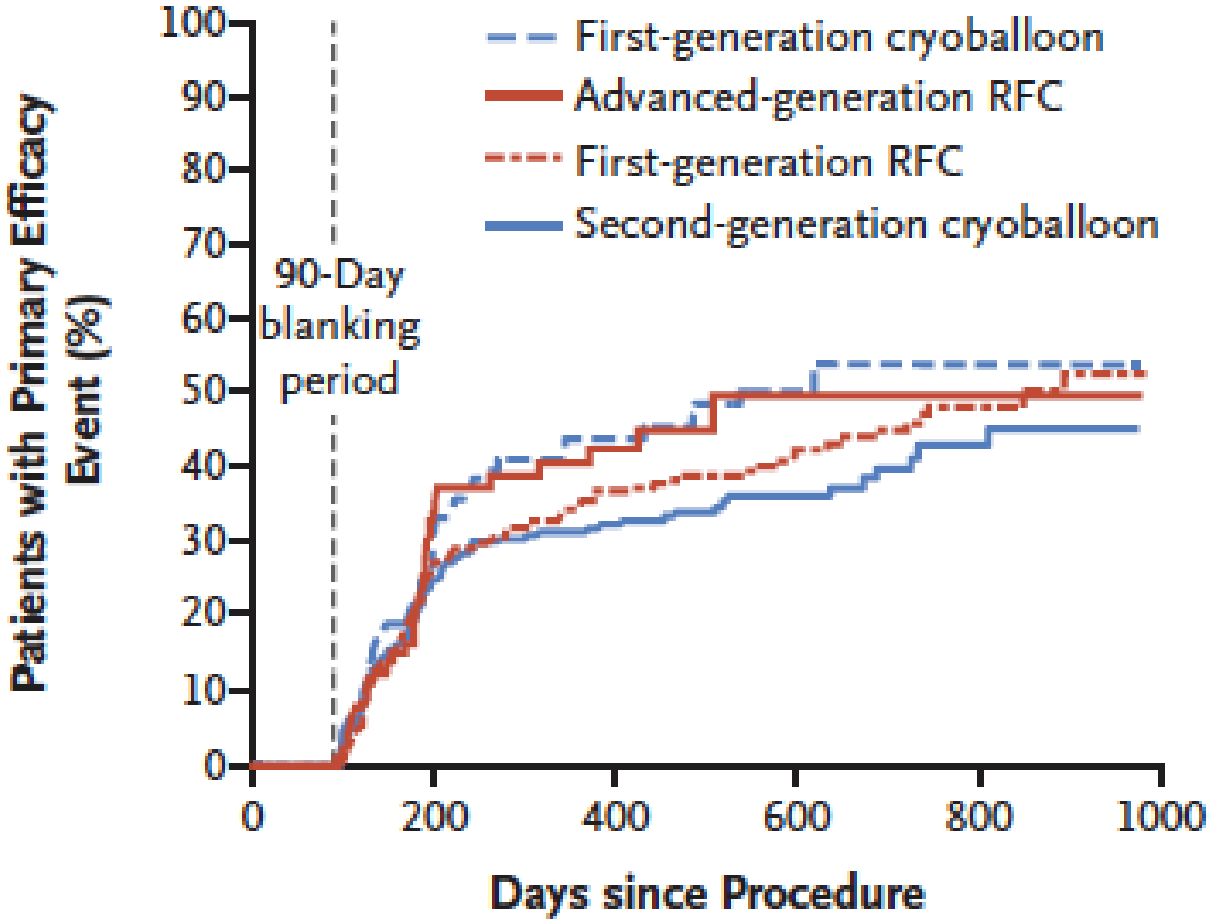
A Primary Efficacy End Point



No. at Risk

Cryoballoon	374	338	242	194	165	132	107	70	57	34	12
RFC	376	350	243	191	149	118	93	58	44	25	12

B Comparison of Catheters

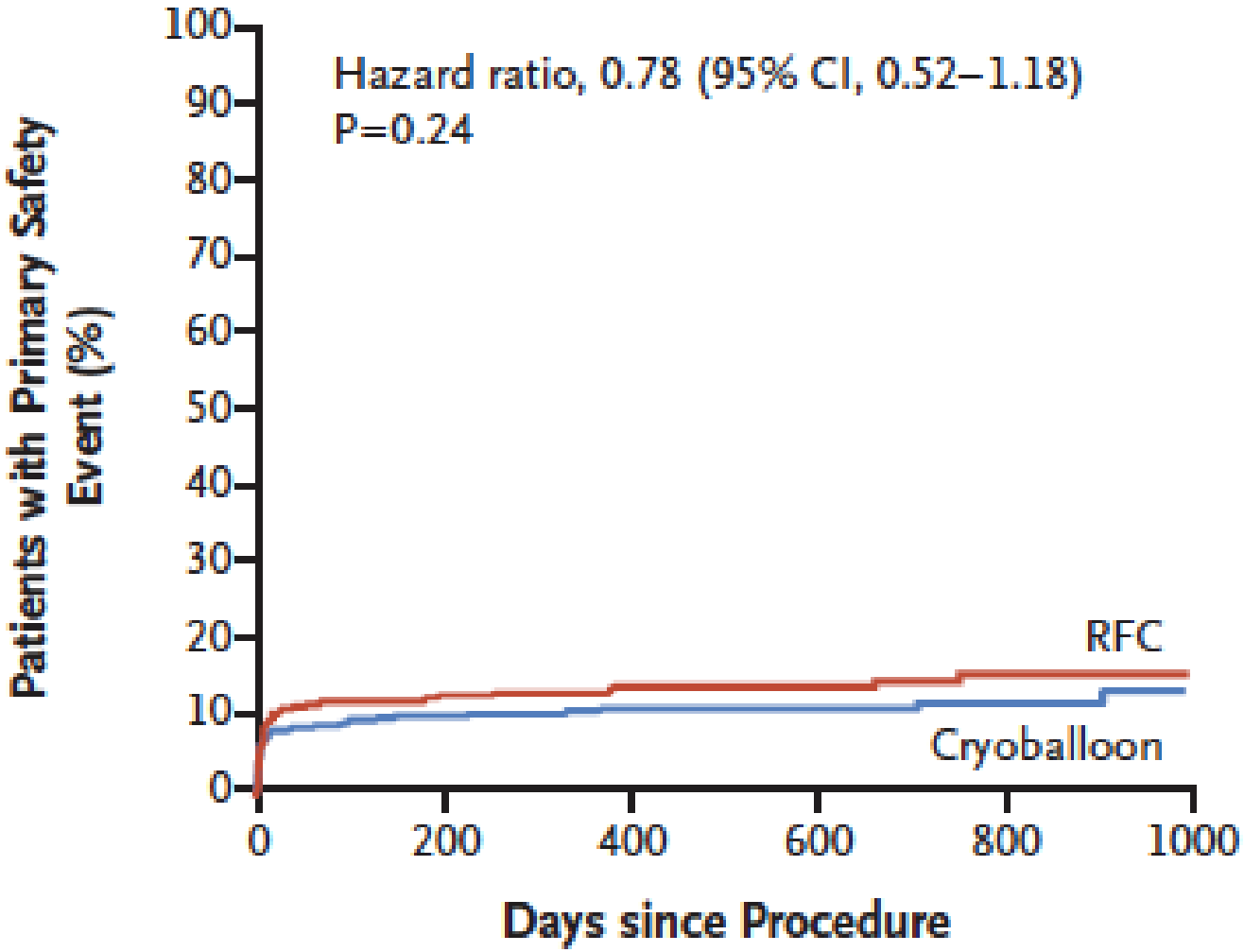


No. at Risk

First-generation cryoballoon	90	83	58	42	36	32	30	24	21	15	8
Second-generation cryoballoon	279	251	183	151	128	99	76	45	35	19	4
First-generation RFC	284	260	187	151	121	104	84	54	42	23	10
Advanced-generation RFC	93	90	55	40	28	15	9	4	2	1	0

End Point	Radiofrequency Group (N=376)	Cryoballoon Group (N=374)	P Value*
	no. of patients (%)		
Primary safety end point†	51 (12.8)‡	40 (10.2)‡	
Death from any cause§	0	2 (0.5)¶	0.50
Stroke or TIA from any cause§	2 (0.5)	2 (0.5)	1.00
Atrial arrhythmia§‖	13 (3.5)	8 (2.1)	0.38
Atrial flutter or atrial tachycardia	10 (2.7)	3 (0.8)	0.09
Non–arrhythmia-related serious adverse events§	36 (9.6)	28 (7.5)	0.36
Groin-site complication**	16 (4.3)	7 (1.9)	0.09
Unresolved phrenic nerve injury††			
At discharge	0	10 (2.7)	0.001
At 3 months	0	2 (0.5)	0.25
At >12 months	0	1 (0.3)	0.50
Cardiac tamponade or pericardial effusion	5 (1.3)	1 (0.3)	0.22
Pulmonary or bronchial complication	4 (1.1)	2 (0.5)	0.69
Transient neurologic complication	3 (0.8)	1 (0.3)	0.62
Dyspnea	2 (0.5)	1 (0.3)	1.00
Gastrointestinal complication	2 (0.5)	1 (0.3)	1.00
Other, nonarrhythmia cardiac complications‡‡	0	3 (0.8)	0.12
Anxiety	0	1 (0.3)	0.50
Contrast media reaction	1 (0.3)	0	1.00
Contusion	1 (0.3)	0	1.00
Esophageal ulcer	0	1 (0.3)	0.50
Hematuria	1 (0.3)	0	1.00
Local edema	1 (0.3)	0	1.00
Atrioesophageal fistula	0	0	—
Pulmonary vein stenosis	0	0	—

C **Primary Safety End Point**

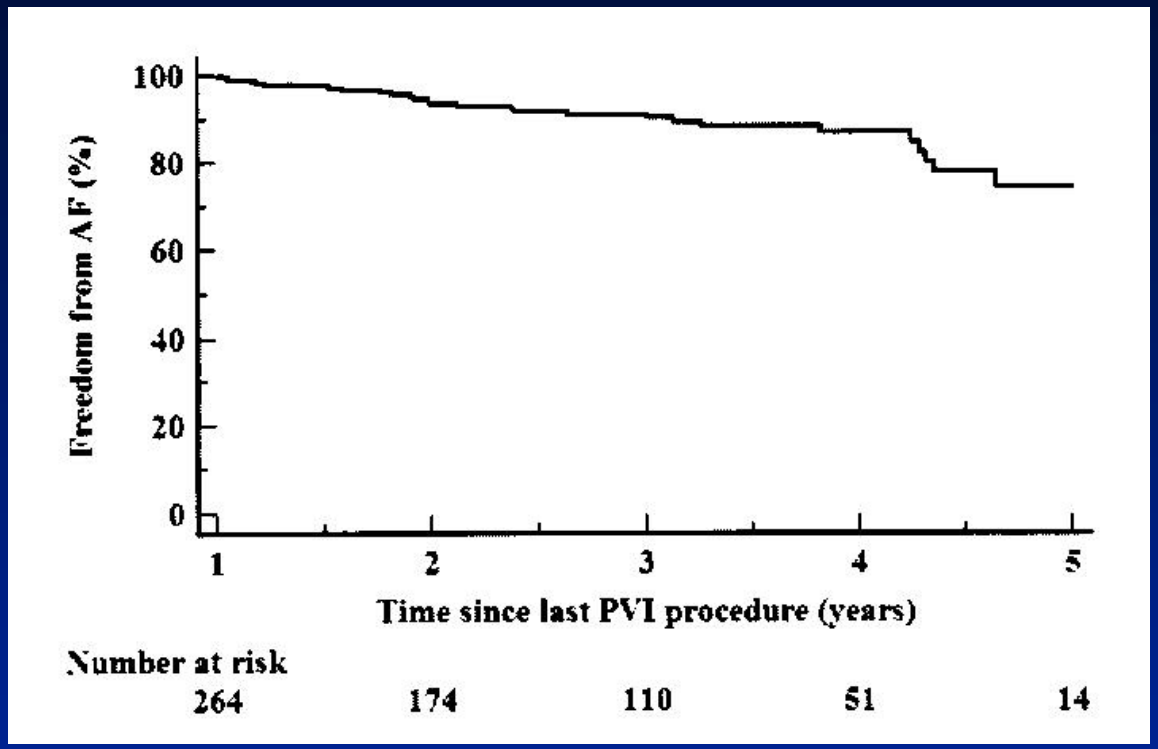


Catheter Ablation of Paroxysmal Atrial Fibrillation: Where Do We Stand in 2014

The Good News

#1 The Procedures is Standardized
#2 We Have Learned a Lot About the Procedure

Long Term Efficacy of AF Ablation



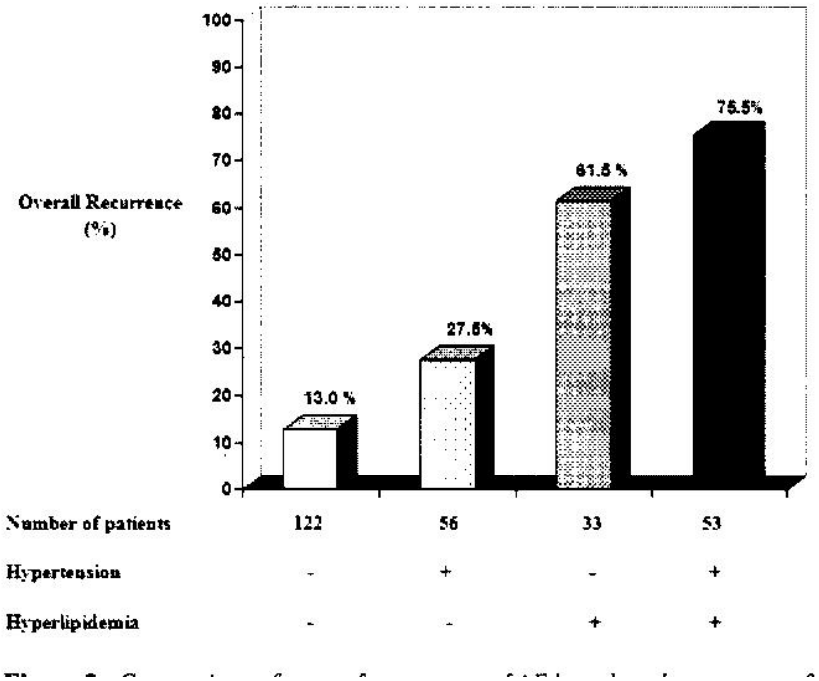
23 / 264 patients (8.7%) developed AF

2 yr recurrence – 5.8%

5 year recurrence – 25.5%

Predictors of recurrence
Hypertension (OR 2.2)
Hypelipidemia (OR 4.4)

Shah et al. J Cadiovasc Electrophysiol 2008



Who to Ablate?

2012 HRS/EHRA/ECAS Expert Consensus Statement on Catheter and Surgical Ablation of Atrial Fibrillation: Recommendations for Patient Selection, Procedural Techniques, Patient Management and Follow-up, Definitions, Endpoints, and Research Trial Design

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Heart Rhythm, EuroPace, JICE March 1, 2012

Indications for Catheter Ablation of Atrial Fibrillation

Indications for catheter ablation of AF	Class	Level
Symptomatic AF refractory or intolerant to at least one Class 1 or 3 antiarrhythmic medication		
Paroxysmal: Catheter ablation is recommended*	I	A
Persistent: Catheter ablation is reasonable	IIa	B
Longstanding Persistent: Catheter ablation may be considered	IIb	B
Symptomatic AF prior to initiation of antiarrhythmic drug therapy with a Class 1 or 3 antiarrhythmic agent		
Paroxysmal: Catheter ablation is reasonable	IIa	B
Persistent: Catheter ablation may be considered	IIb	C
Longstanding Persistent: Catheter ablation may be considered	IIb	C

European Heart Journal
doi:10.1093/eurheartj/ehs253

ESC GUIDELINES

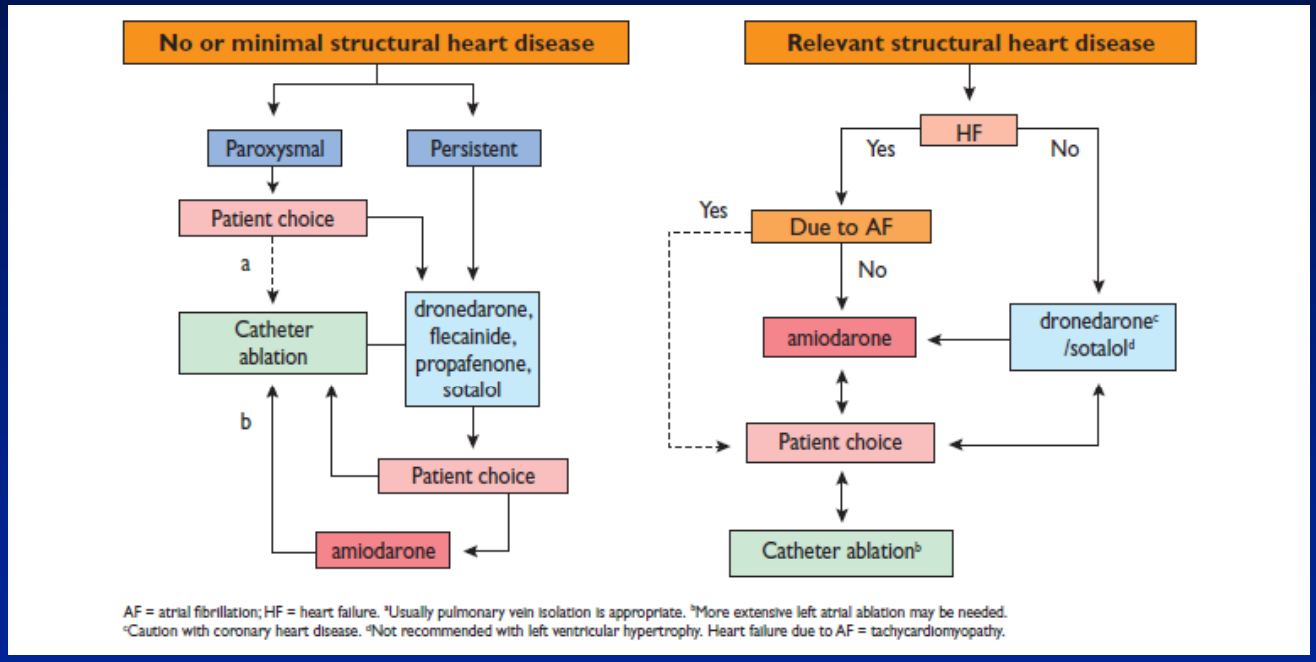
2012 focused update of the ESC Guidelines for the management of atrial fibrillation

An update of the 2010 ESC Guidelines for the management of atrial fibrillation
Developed with the special contribution of the European Heart Rhythm Association

Authors/Task Force Members: A. John Camm (Chairperson) (UK)*, Gregory Y.H. Lip (UK), Raffaele De Caterina (Italy), Irene Savelieva (UK), Dan Atar (Norway), Stefan H. Hohnloser (Germany), Gerhard Hindricks (Germany), Paulus Kirchhof (UK)

Recommendations for left atrial ablation

Recommendations	Class[a]	Level[b]	Ref[c]
Catheter ablation of symptomatic paroxysmal AF is recommended in patients who have symptomatic recurrences of AF on antiarrhythmic drug therapy (amiodarone, dronedarone, flecainide, propafenone, sotalol) and who prefer further rhythm control therapy, when performed by an electrophysiologist who has received appropriate training and is performing the procedure in an experienced centre.	I	A	192, 193
Catheter ablation of AF should target isolation of the pulmonary veins.	IIa	A	170, 172, 192, 194
Catheter ablation of AF should be considered as first-line therapy in selected patients with symptomatic paroxysmal AF as an alternative to antiarrhythmic drug therapy, considering patient choice, benefit, and risk.	IIa	B	156–158
When catheter ablation of AF is planned, continuation of oral anticoagulation with a VKA should be considered during the procedure, maintaining an INR close to 2.0.	IIa	B	170, 181–184
When AF recurs within the first 6 weeks after catheter ablation, a watch-and-wait rhythm control therapy should be considered.	IIa	B	195



AF = atrial fibrillation; HF = heart failure. [a]Usually pulmonary vein isolation is appropriate. [b]More extensive left atrial ablation may be needed. [c]Caution with coronary heart disease. [d]Not recommended with left ventricular hypertrophy. Heart failure due to AF = tachycardiomyopathy.

ESC 2012
Focused Update

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CLINICAL PRACTICE GUIDELINE: FULL TEXT

2014 AHA/ACC/HRS Guideline for the Management of Patients With Atrial Fibrillation

A Report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines and the Heart Rhythm Society

Developed in Collaboration With the Society of Thoracic Surgeons

6.3. AF Catheter Ablation to Maintain Sinus Rhythm: Recommendations

CLASS I

1. AF catheter ablation is useful for symptomatic paroxysmal AF refractory or intolerant to at least 1 class I or III antiarrhythmic medication when a rhythm-control strategy is desired (363,392–397). *(Level of Evidence: A)*
2. Before consideration of AF catheter ablation, assessment of the procedural risks and outcomes relevant to the individual patient is recommended. *(Level of Evidence: C)*

CLASS IIa

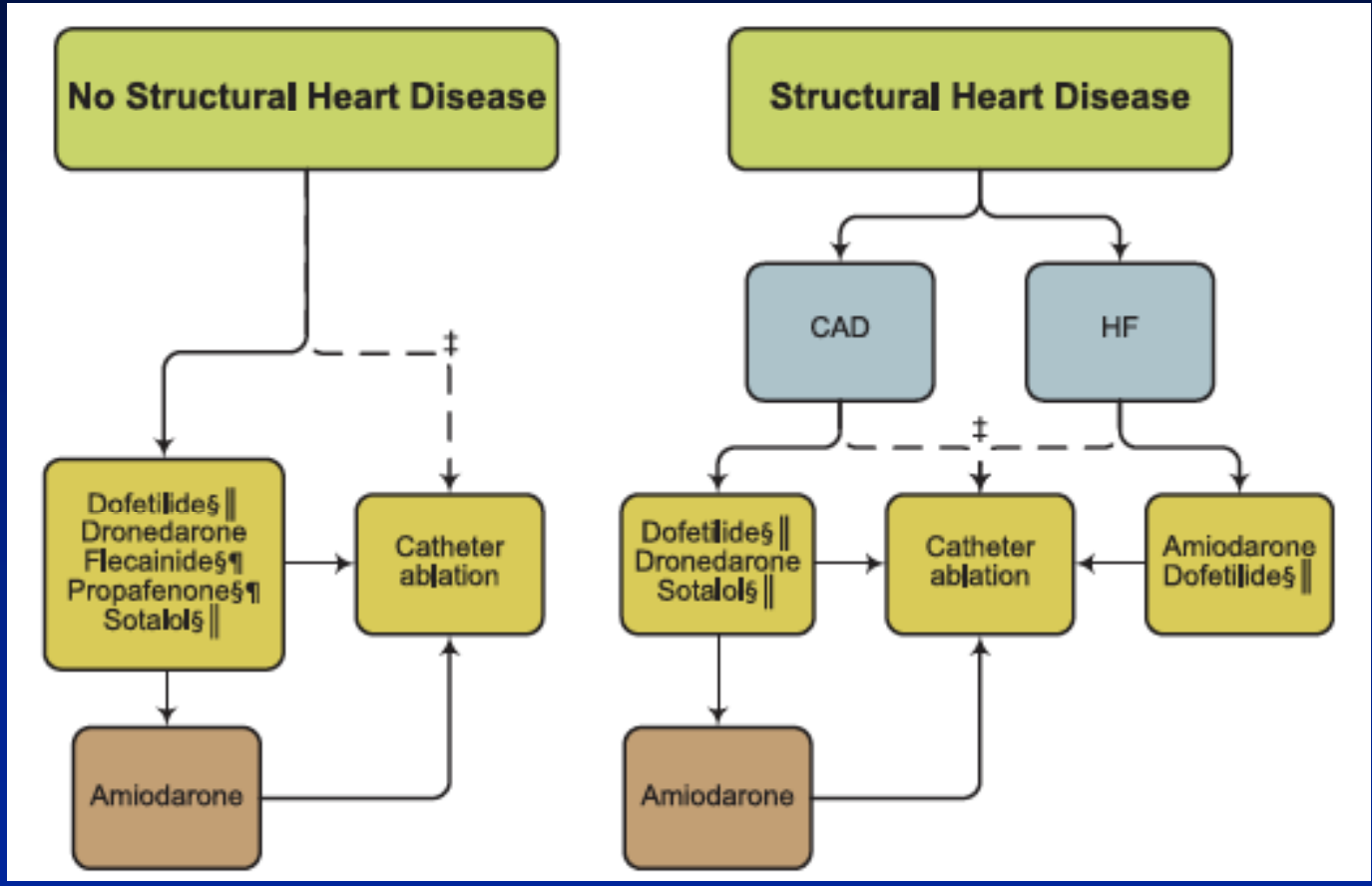
1. AF catheter ablation is reasonable for some patients with symptomatic persistent AF refractory or intolerant to at least 1 class I or III antiarrhythmic medication (394,398–400). *(Level of Evidence: A)*
2. In patients with recurrent symptomatic paroxysmal AF, catheter ablation is a reasonable initial rhythm-control strategy before therapeutic trials of antiarrhythmic drug therapy, after weighing the risks and outcomes of drug and ablation therapy (401–403). *(Level of Evidence: B)*

CLASS IIb

1. AF catheter ablation may be considered for symptomatic long-standing (>12 months) persistent AF refractory or intolerant to at least 1 class I or III antiarrhythmic medication when a rhythm-control strategy is desired (363,404). *(Level of Evidence: B)*
2. AF catheter ablation may be considered before initiation of antiarrhythmic drug therapy with a class I or III antiarrhythmic medication for symptomatic persistent AF when a rhythm-control strategy is desired. *(Level of Evidence: C)*

CLASS III: HARM

1. AF catheter ablation should not be performed in patients who cannot be treated with anticoagulant therapy during and after the procedure. *(Level of Evidence: C)*



Who to Ablate

Patients with symptomatic paroxysmal AF who have failed a trial of one or more antiarrhythmic medications.

Patients with symptomatic paroxysmal atrial fibrillation with marked sinus bradycardia or tachy/brady syndrome in whom antiarrhythmic therapy may trigger need for a PPM.

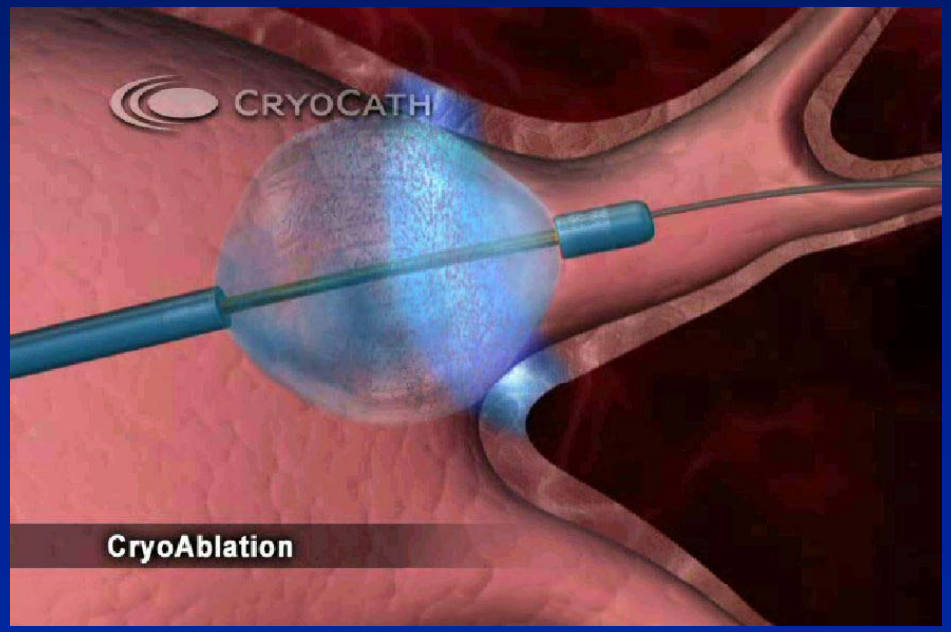
Patients with symptomatic paroxysmal atrial fibrillation who have not failed medications but wish to proceed with AF ablation after carefully weighing therisks and benefits of the procedure.

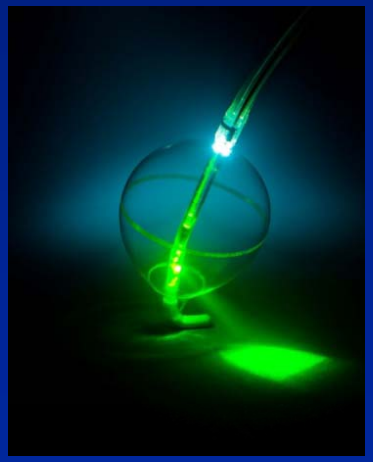
How to Ablate?

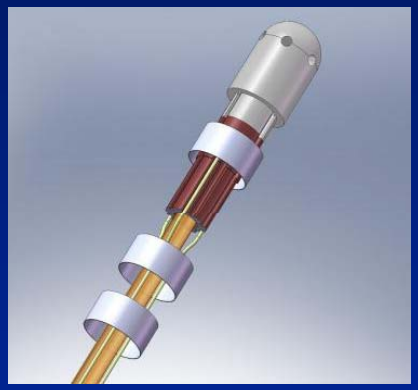
Table 3 Recommendations regarding ablation technique

- Ablation strategies that target the PVs and/or PV antrum are the cornerstone for most AF ablation procedures.
- If the PVs are targeted, electrical isolation should be the goal.
- Achievement of electrical isolation requires, at a minimum, assessment and demonstration of entrance block into the PV.
- Monitoring for PV reconduction for 20 minutes following initial PV isolation should be considered.
- For surgical PV isolation, entrance and/or exit block should be demonstrated.
- Careful identification of the PV ostia is mandatory to avoid ablation within the PVs.
- If a focal trigger is identified outside a PV at the time of an AF ablation procedure, ablation of that focal trigger should be considered.
- If additional linear lesions are applied, operators should consider using mapping and pacing maneuvers to assess for line completeness.
- Ablation of the cavotricuspid isthmus is recommended in patients with a history of typical atrial flutter or inducible cavotricuspid isthmus dependent atrial flutter.
- If patients with longstanding persistent AF are approached, operators should consider more extensive ablation based on linear lesions or complex fractionated electrograms.
- It is recommended that RF power be reduced when creating lesions along the posterior wall near the esophagus.

Which Tool to Use ?







When to Ablate?

AF ablation is performed to improve quality of life;
Therefore the decision to perform AF ablation can only be made by the patient based on their AF burden, their AF symptoms, values, and preferences.

Important considerations include:

1. The severity of the patient's AF symptoms?
2. The frequency and duration of the patients AF episodes.
3. Whether antiarrhythmic mediations have been failed.
4. I believe that a clear time to discuss ablation is when paroxysmal AF transitions into persistent AF.

Please Remember

1. AF ablation is a palliative rather than a curative procedure.
2. Late recurrences are common.
3. AF ablation does not impact stroke risk.
4. AF ablation tools and strategies are improving.
5. Patients age slowly.
6. Complications occur in those who arm is twisted to have ablation.

Conclusion

- AF ablation of paroxysmal AF is a well established commonly performed but imperfect procedure performed throughout the world.
- PV isolation is the cornerstone of AF ablation.
- The single procedure success rate at 12 months follow-up in optimal candidates is 60% to 80%.
- In experienced centers the major complication is 1% to 3%.
- Ablation is indicated for treatment of paroxysmal AF who have failed at least one antiarrhythmic medications.
- AF ablation is performed to improve quality of life. There is little to no evidence that it lower stroke risk or other hard endpoints.


THANK YOU!