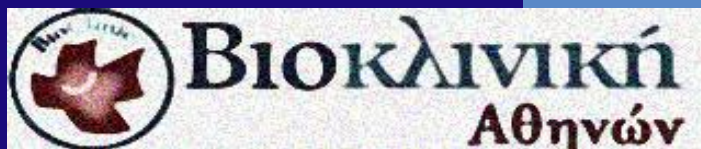




«Εξελίξεις στην Κολπική Μαρμαρυγή»

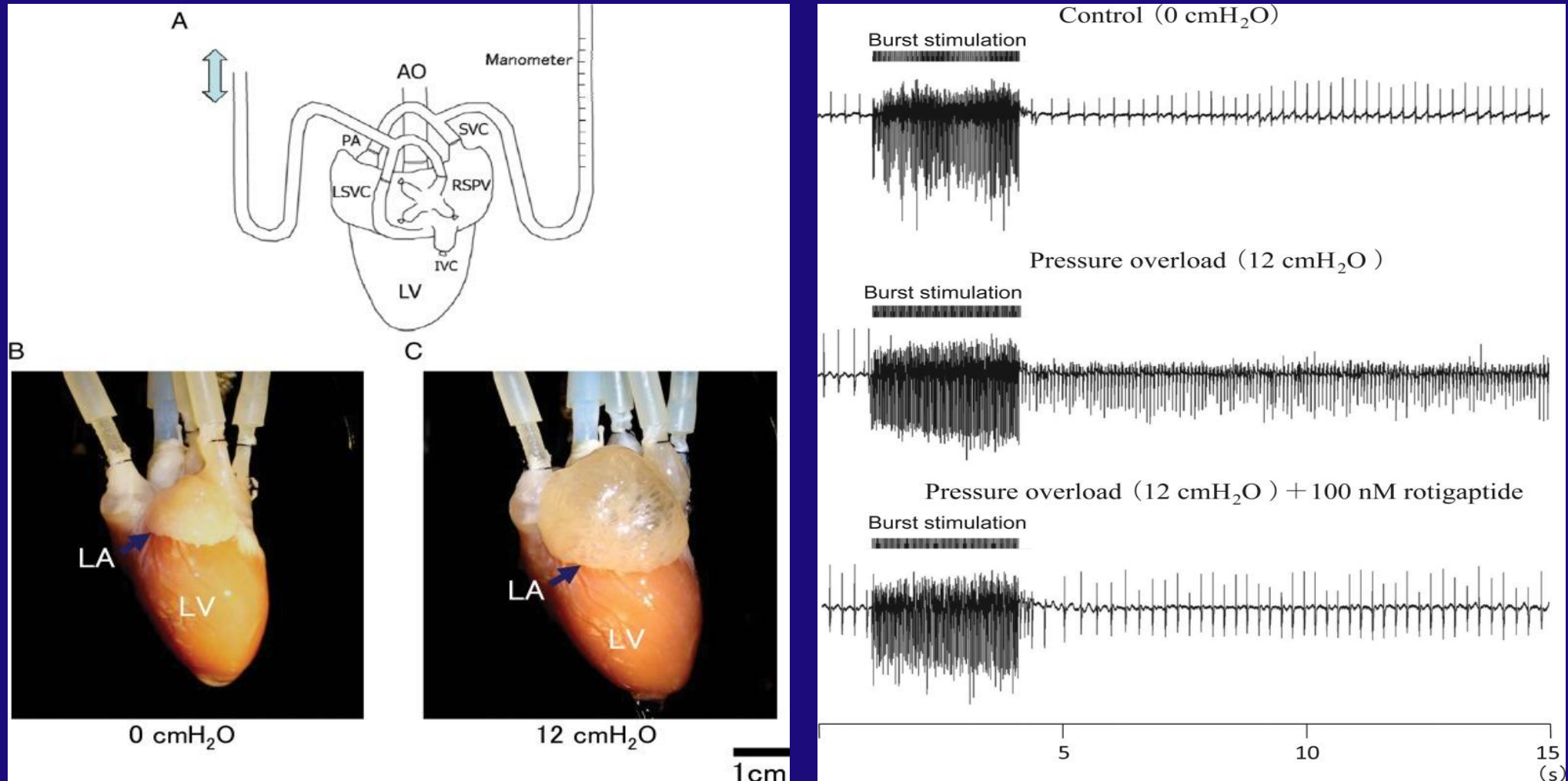
Παναγιώτης Ιωαννίδης
Διευθυντής Τμήματος Αρρυθμιών &
Επεμβατικής Ηλεκτροφυσιολογίας Βιοκλινικής Αθηνών



2^ο Αρρυθμιολογικό Συνέδριο
Αθήνα, 1-10-2016



Atrial fibrillation can be induced under special circumstances even in normal atrial myocardium





Aggressive Risk Factor Reduction Study for Atrial Fibrillation and Implications for the Outcome of Ablation

The ARREST-AF Cohort Study

Rajeev K. Pathak, MBBS,* Melissa E. Middeldorp,* Dennis H. Lau, MBBS, PhD,* Abhinav B. Mehta, MACTST,† Rajiv Mahajan, MD,* Darragh Twomey, MBBS,* Muayad Alasady, MBBS,*† Lorraine Hanley, BSc,* Nicholas A. Antic, MBBS, PhD,‡ R. Doug McEvoy, MBBS, MD,‡ Jonathan M. Kalman, MBBS, PhD,§ Walter P. Abhayaratna, MBBS, PhD,|| Prashanthan Sanders, MBBS, PhD*

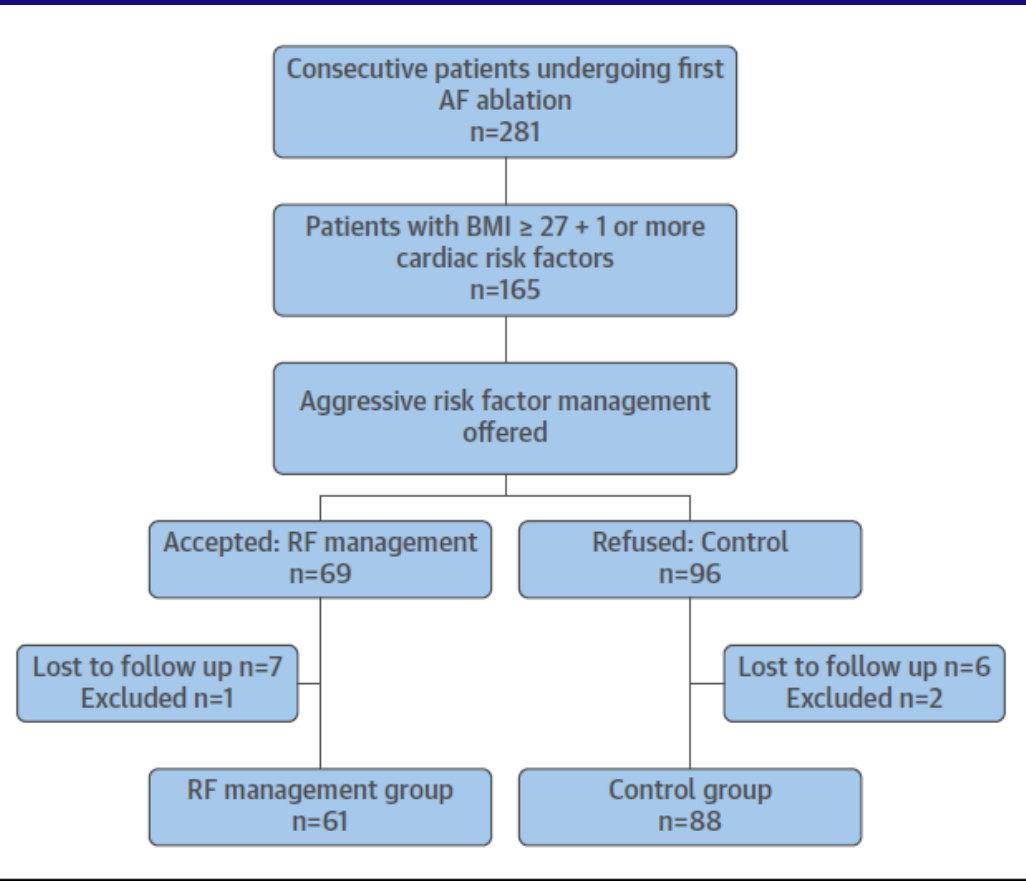
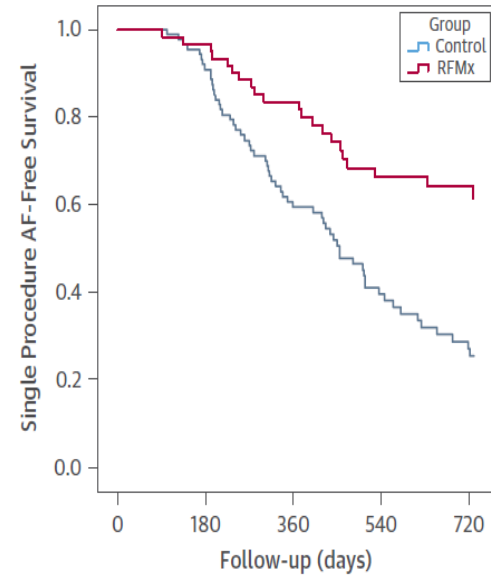
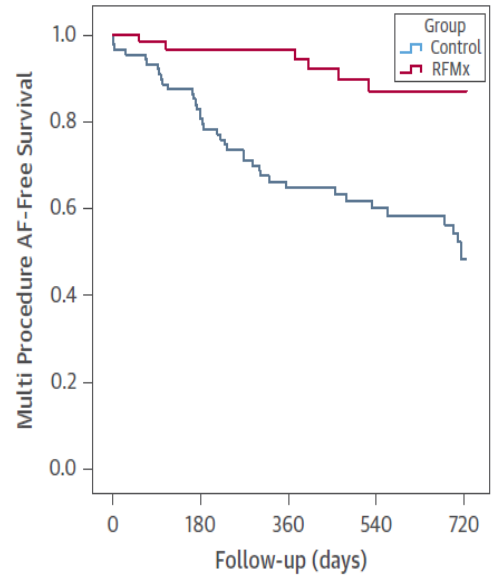


FIGURE 1 Patient Selection



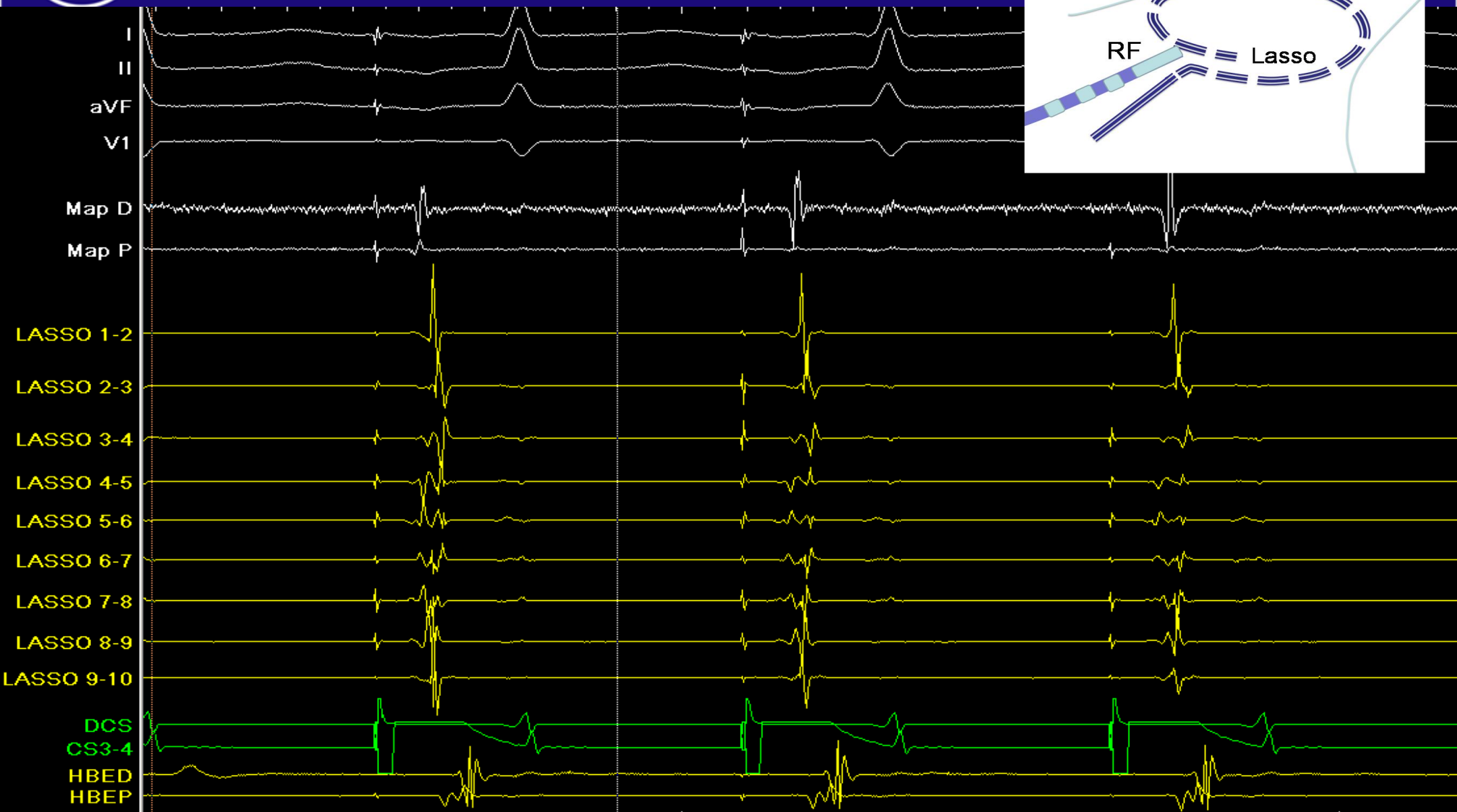
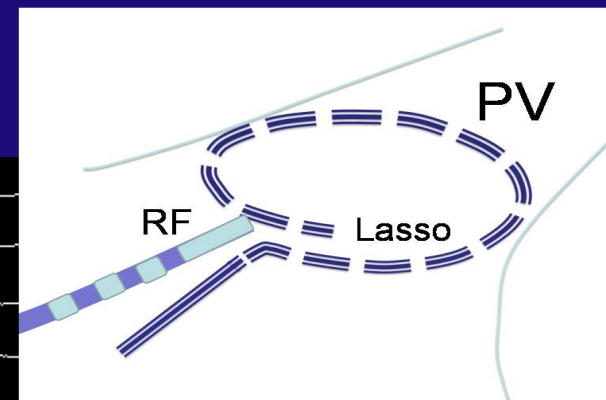
Time (days)	0	180	360	540	730
RFM	61	59	48	33	27
Control	88	79	51	28	16



Time (days)	0	180	360	540	730
RFM	61	55	46	32	25
Control	88	72	51	36	23

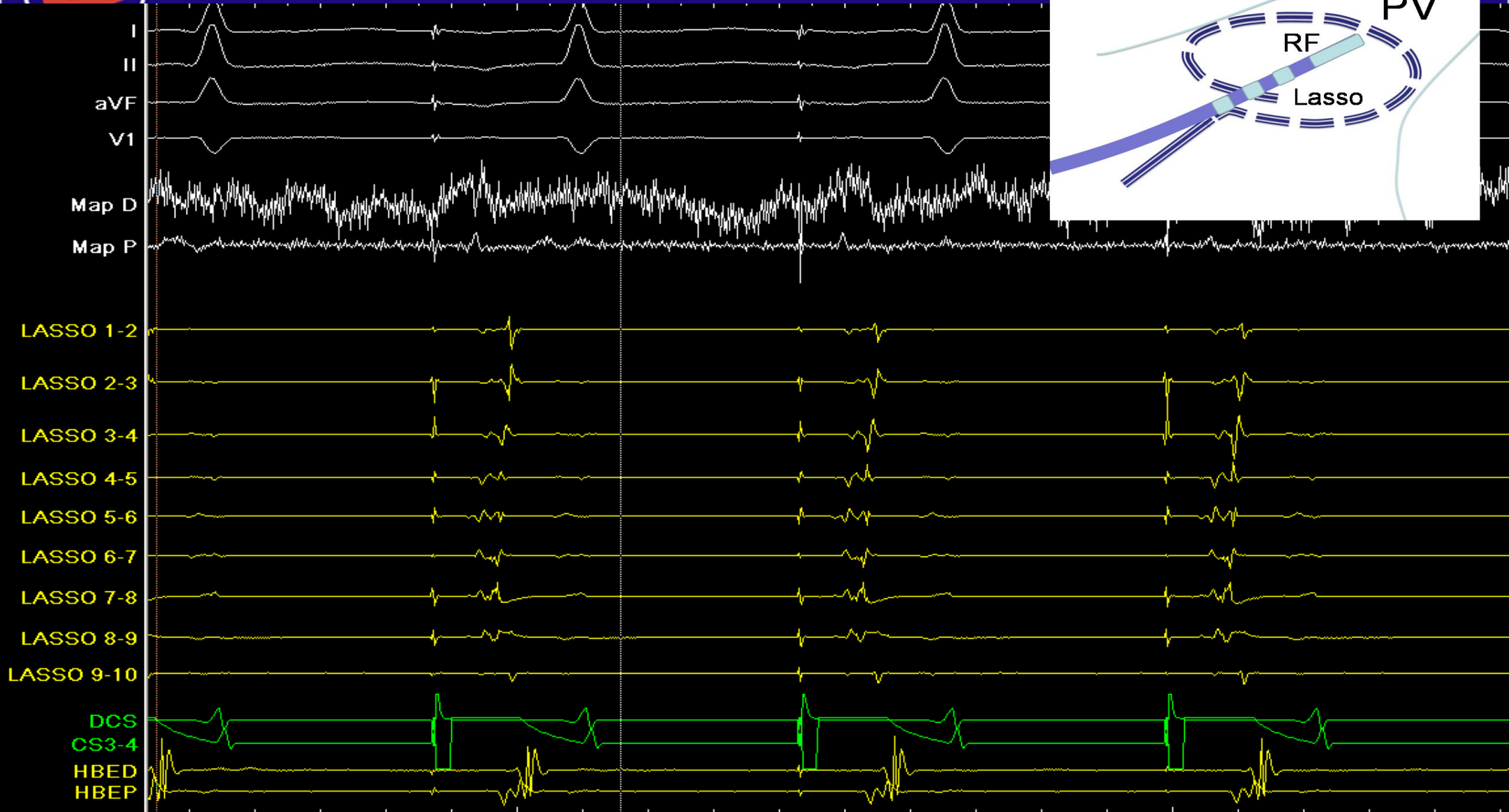
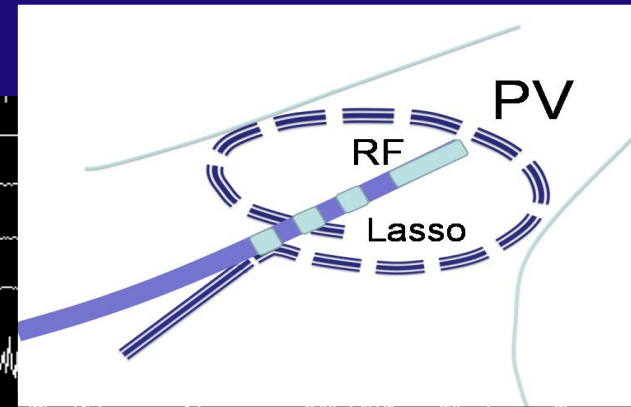


Electrical PV isolation



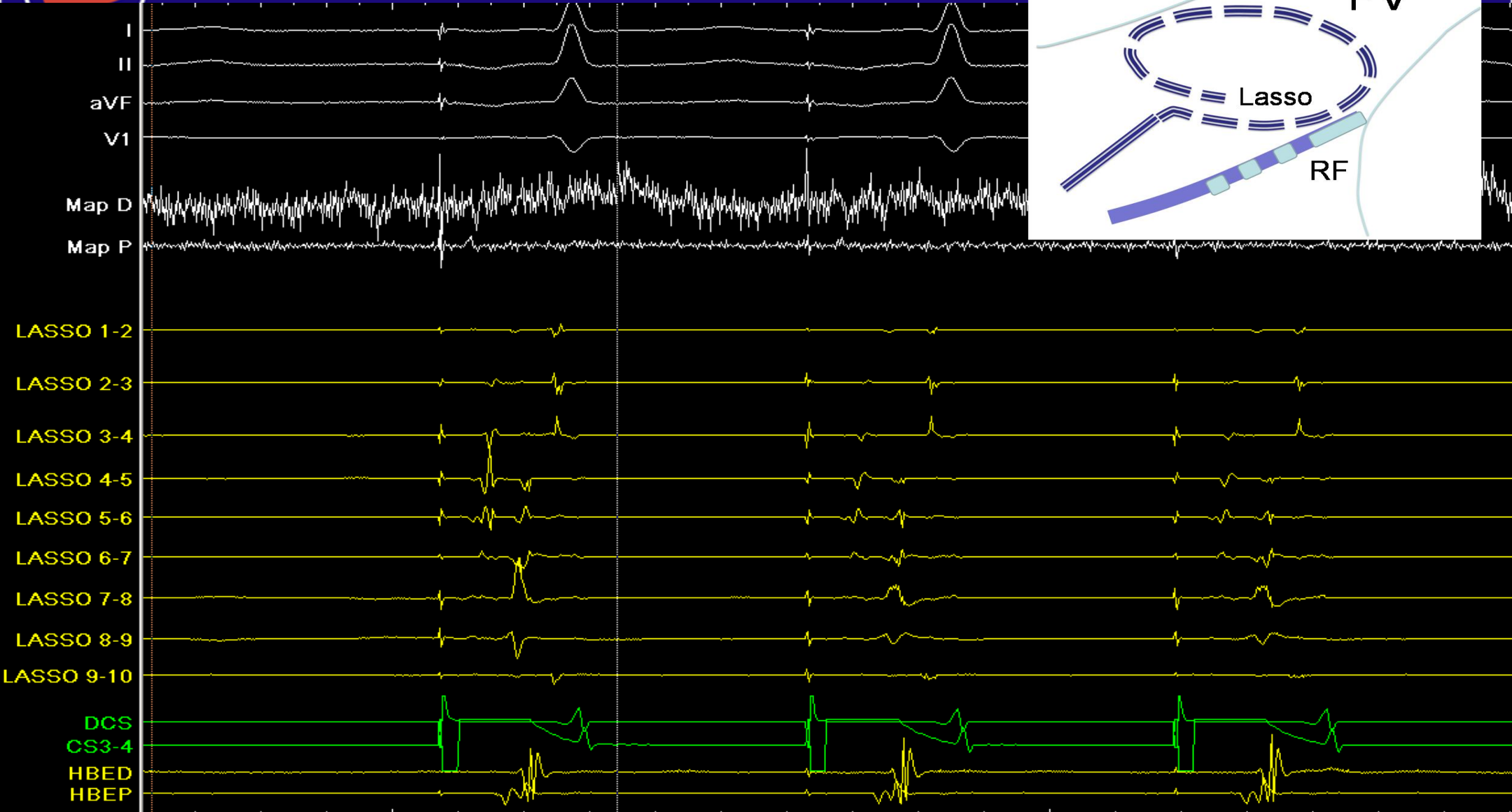
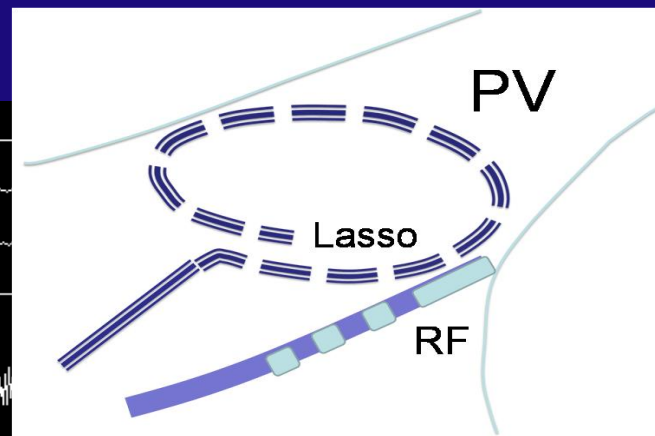


Electrical PV isolation



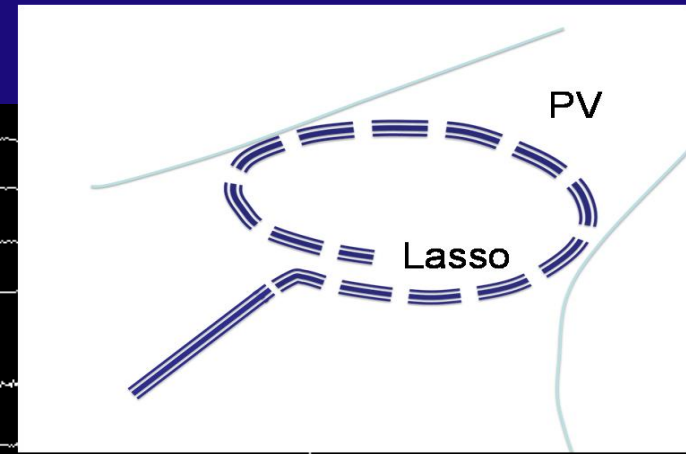


Electrical PV isolation





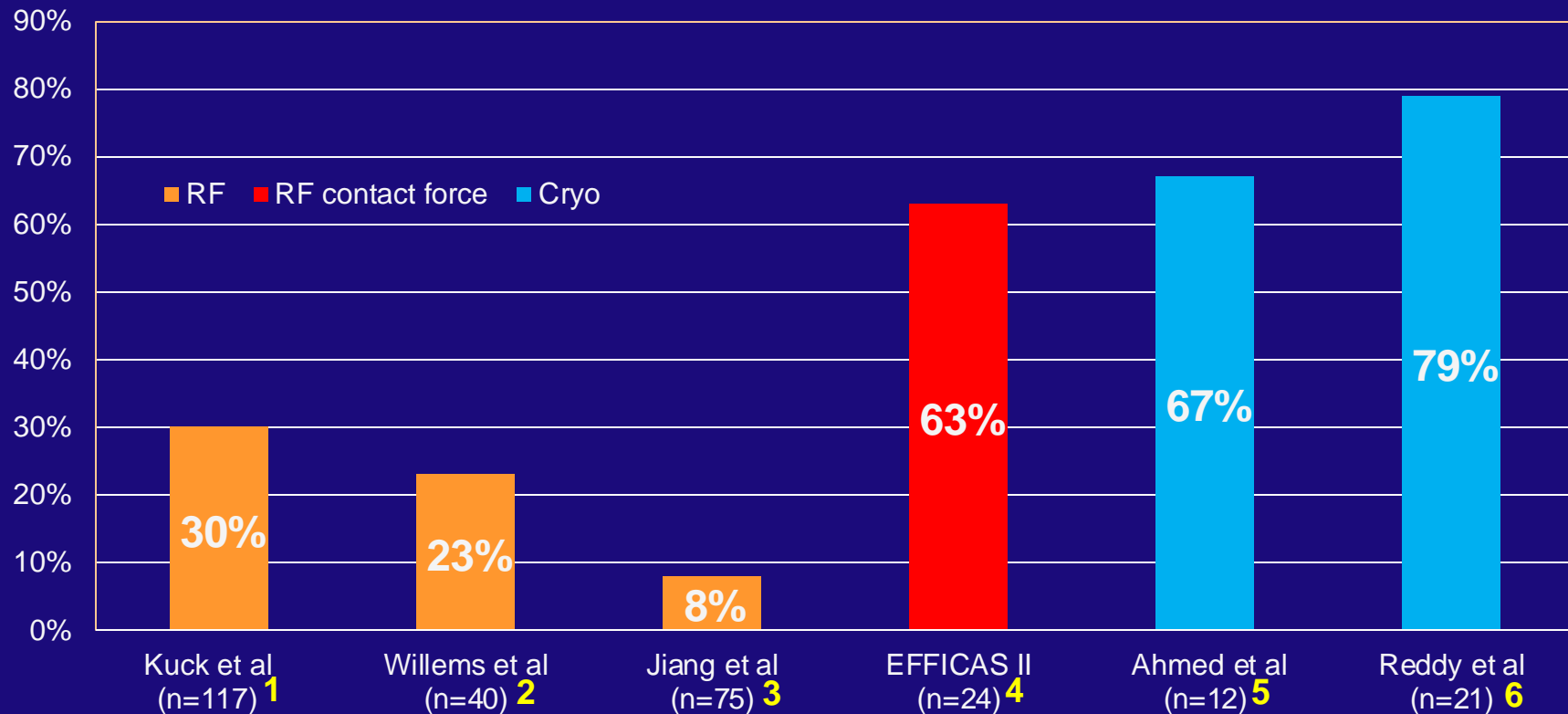
Electrical PV isolation





Durability of PVI: RF vs. Cryo

% of patients with complete PVI during remapping procedure



Study	Follow-up
Kuck et al	3 months
Willems et al	3 months
Jiang et al	12 months
EFFICAS II	3 months
Ahmed et al	3 months
Reddy et al	~3 months

¹ Kuck et al. *Circ Arrhythm Electrophysiol.* 2016;9:e003337

² Willems et al. *J. Cardiovasc Electrophysiol* 2010;21:1079-84

³ Jiang et al. *Heart Rhythm* 2014;11:969-76

⁴ Kautzner et al. *Europace* 2015;17:1229-35.

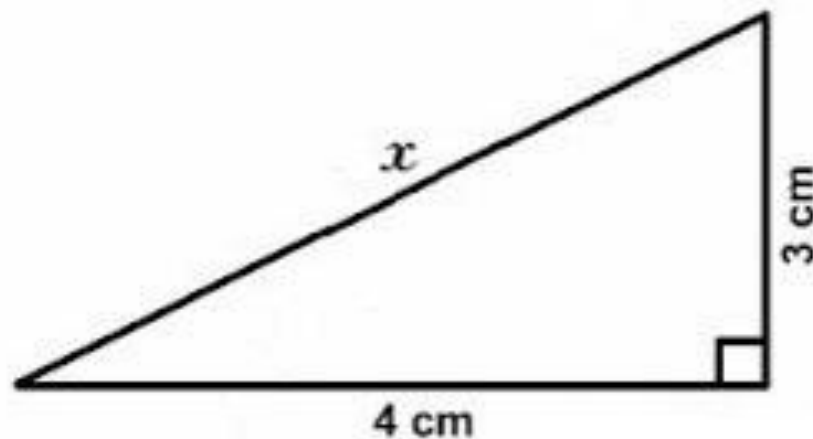
⁵ Ahmed et al. *J Cardiovasc Electrophysiol* 2010;21:731-7

⁶ Miyazaki et al. *International Journal of Cardiology* 2016;220:395-399



Cardiac Electrophysiology; it's all mathematics...

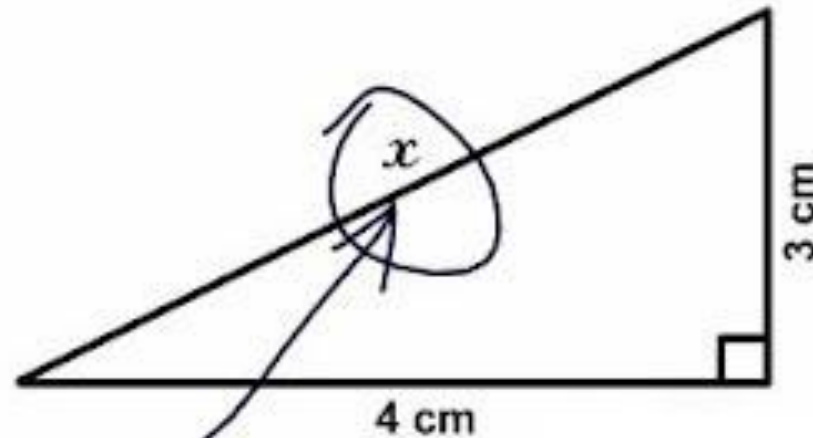
3. Βρείτε το x .





Cardiac Electrophysiology; it's all ~~mathematics...~~ *simple*

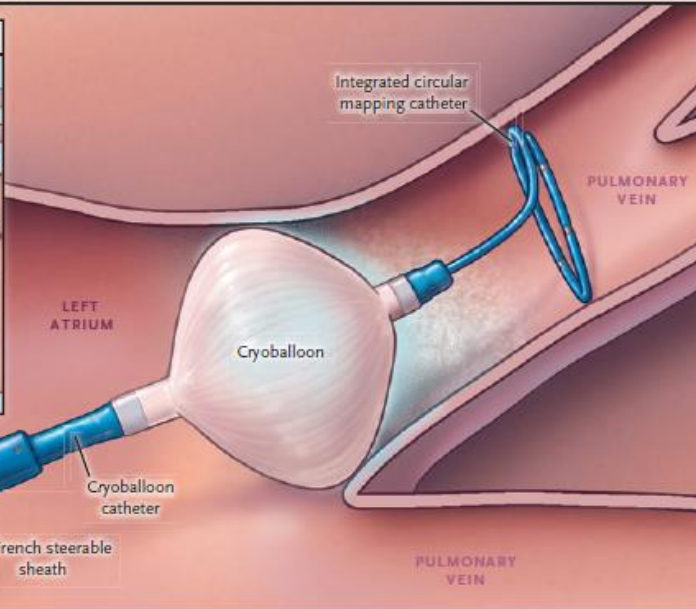
3. Βρείτε το χ .



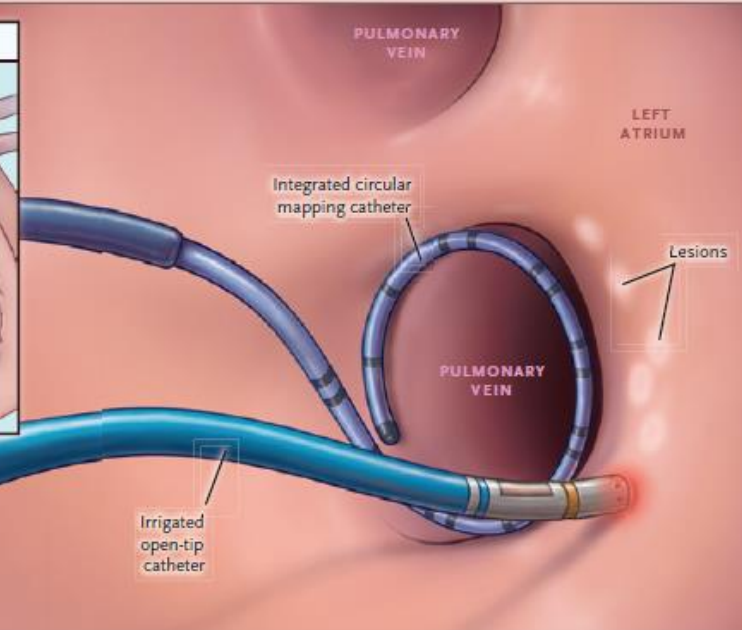
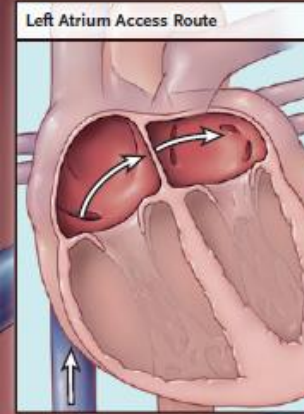
Νά το



A Cryoballoon Ablation of Pulmonary Vein



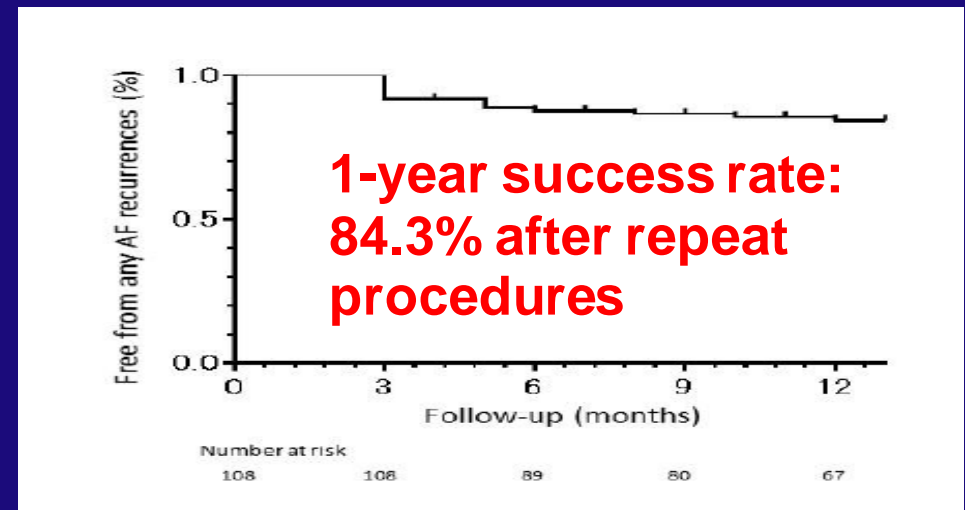
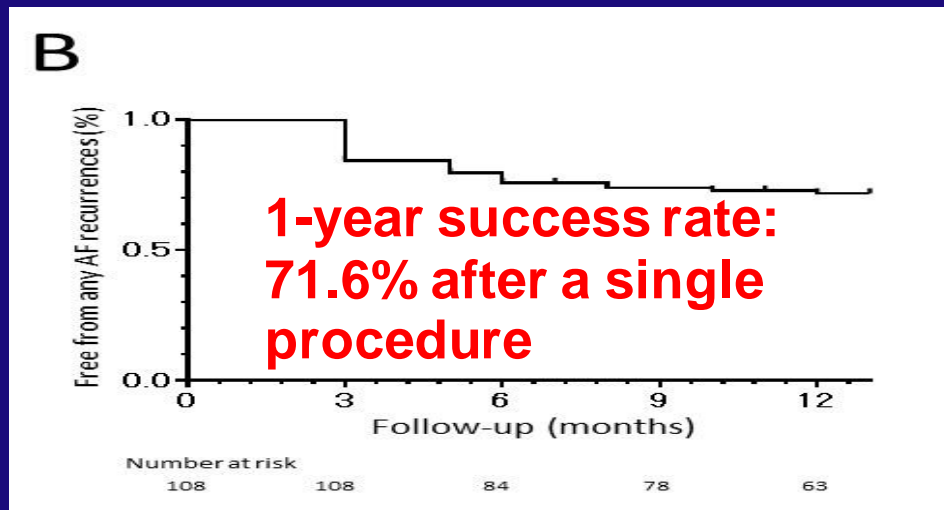
B Radiofrequency Current Ablation of Pulmonary Vein





Pulmonary Vein Isolation Using a Second-generation Cryoballoon in Patients With Paroxysmal Atrial Fibrillation: One-year Outcome Using a Single Big-balloon 3-minute Freeze Technique

- 108 pts with paroxysmal AF → cryothermal PVI with 28-mm cryoballoon using single 3-minute freeze techniques without bonus applications
- 425 PVs, 409 (96.2%) were isolated using exclusively cryoballoons / 16 required touch-up ablation
- Complications: Total:10,2%
 - Transient phrenic nerve injury: 9(8,3%), pericardial tamponade: 1(0,9%), and 50% PV stenosis:1(0,9%)



- Real-time PV potential monitoring was possible in 65 **LSPVs (64.4%)**, 51 **LIPVs (50.5%)**, 48 **RSPVs (44.4%)**, and 44 **RIPVs (40.7%)**.

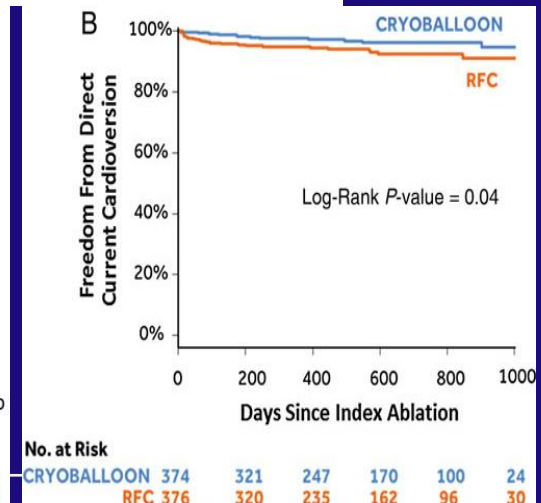
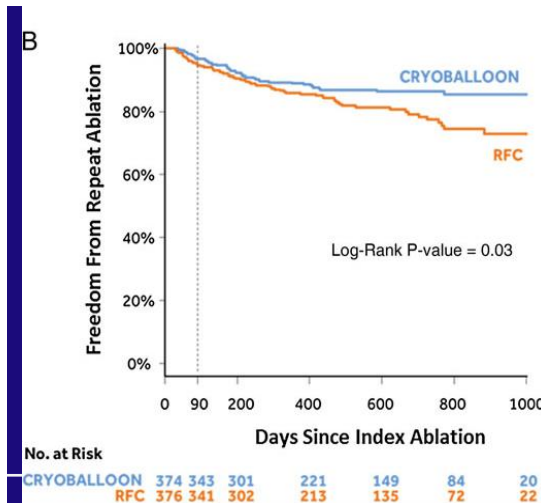
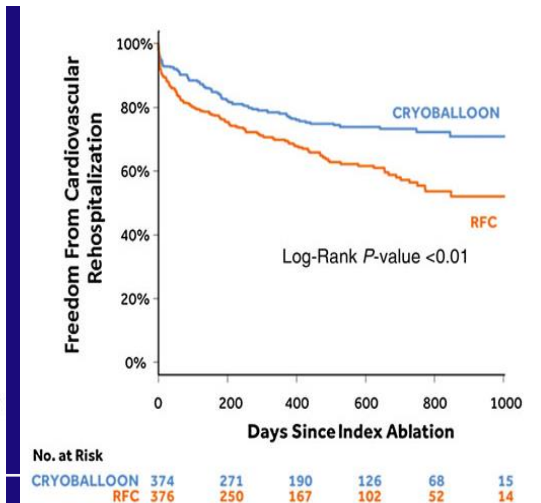
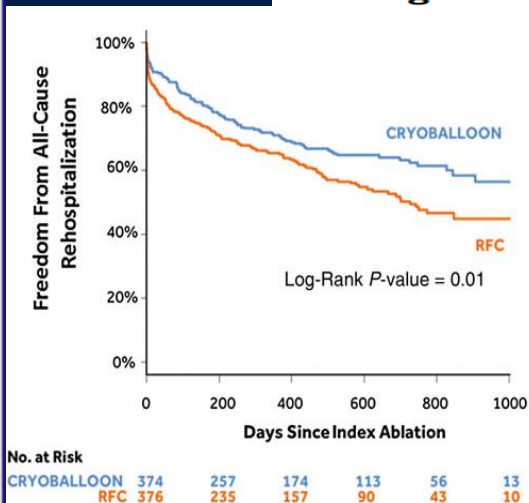


**FIRE
AND
ICESM**

AF Ablation Clinical Trial

Cryoballoon or radiofrequency ablation for symptomatic paroxysmal atrial fibrillation: reintervention, rehospitalization, and quality-of-life outcomes in the FIRE AND ICE trial

Karl-Heinz Kuck^{1*}, Alexander Fürnkranz², K.R. Julian Chun², Andreas Metzner¹, Feifan Ouyang¹, Michael Schlüter¹, Arif Elvan³, Hae W. Lim⁴, Fred J. Kueffer⁴, Thomas Arentz⁵, Jean-Paul Albenque⁶, Claudio Tondo⁷, Michael Kühne⁸, Christian Sticherling⁸, and Josep Brugada⁹, on behalf of the FIRE AND ICE Investigators



	Total No. Events; Subjects with Events		
	Cryoballoon (N=369)	RFC (N=377)	P-value
All-cause rehospitalizations	210; 122 (33.1%)	261; 152 (40.3%)	0.02
Cardiovascular rehospitalizations	139; 89 (24.1%)	198; 132 (35.0%)	< 0.01
Repeat ablations	49; 44 (11.9%)	69; 65 (17.2%)	0.04
Direct current cardioversions	13; 12 (3.3%)	27; 23 (6.1%)	0.06

Kuck et al. Eur Heart J. 2016 Jul 5. [Epub ahead of print]
Kuck et al. ESC Congress 2016 • Rome, Italy

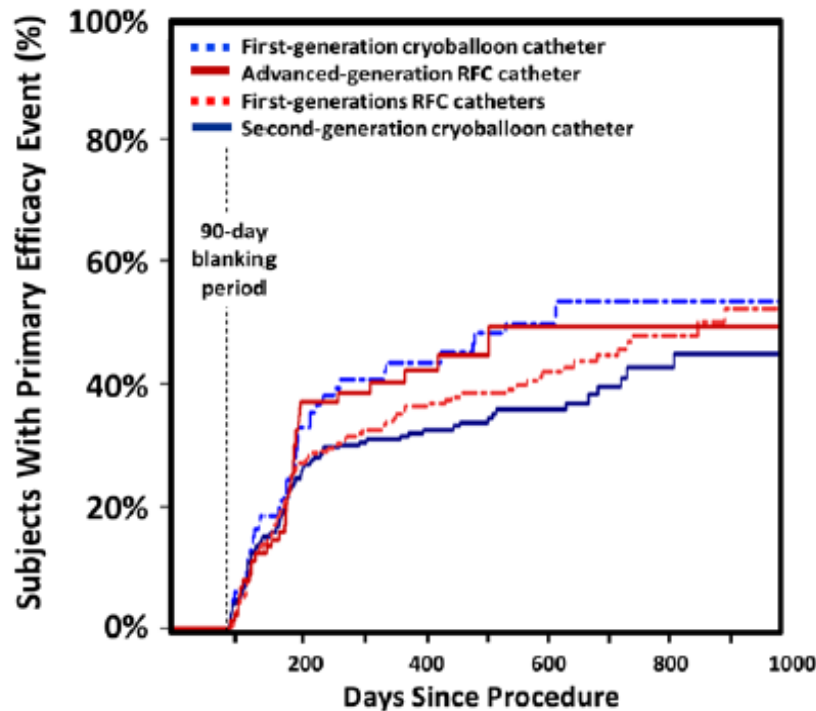


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(Predefined Subgroup Analysis)

Log-rank test:
no significant heterogeneity (p = 0.25)

Number 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-generations 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

Kuck et al. Eur Heart J. 2016 Jul 5. [Epub ahead of print]
Kuck et al. ESC Congress 2016 • Rome, Italy



AF Ablation with Contact Force(CF) vs Non-CF Catheters



AF Ablation with Contact Force(CF) vs Non-CF Catheters

- 140 consecutive patients undergone RF ablation for symptomatic AF with Ensite-NavX 3D mapping system (St Jude Medical)
- Ablation Catheters
 - Non-CF Group (n=70) (from 6/2014 to 10/2015): Therapy™ Cool Flex™ Irrigated Ablation Catheter (St Jude Medical)
 - CF Group (n=70) (from 10/2015 to 9/2016): TactiCath™ Quartz Contact Force Ablation Catheter (St Jude Medical)



→ TARGET **CF** 20 g with range (10 g, 30 g)^{4,5}

→ Min **CF** > 10 g for any ablation points^{4,5}

→ Min **FTI** > 400 gs for any ablation points⁵

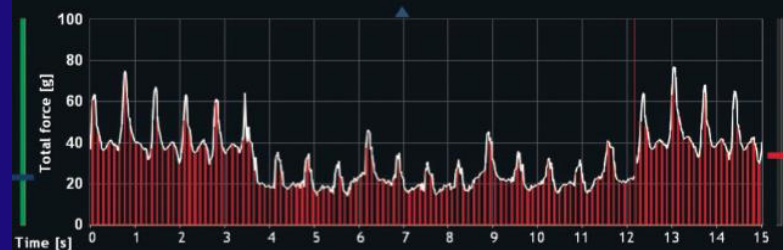
→ ONE SHOT: Transmurality should be achieved in one shot⁵

Force 25 g

Lateral 18 g

Axial 16 g

FTI™ 442 gs





AF Ablation with Contact Force(CF) vs Non-CF Catheters

Baseline characteristics

	Non-CF Group (n=70)	CF Group (n=70)	P
Demographic variables			
Male gender, n (%)	57%	74%	
Age	62.4±9	60.4±10	NS
AF type; Paroxysmal, n (%)	61%	65.7%	NS
Medical history			
Hypertension, n (%)	52.8%	50%	NS
Diabetes, n (%)	10%	8.65	NS
Ischemic heart disease, n (%)	7.1%	5.7%	NS
CHA2DS2VASc score	1.45±1.35	1.4±1.3	NS
Echocardiography			
LA diameter (mm)	42,6±6	43±5	NS
LVEF	56±4%	57.5±4.5%	NS
PV anatomy			
Left PV common ostium	7.1%	5.7%	NS
Additional right PV, n (%)	2.9%	4.3%	NS
Medical treatment before procedure			
β-blockers	50%	51.4%	NS
Propafenone	24.35	28.65	NS
Amiodarone	31.4%	17.1%	NS
Flecainide	8.6%	10%	NS
Sotalol	5.7%	4.3%	NS
Redo procedure, n (%)	12.9%	8.6%	



AF Ablation with Contact Force(CF) vs Non-CF Catheters

Outcome

	Non-CF Group (n=70)	CF Group (n=70)	P
Follow-up (months, mean \pm SD)	20,1 \pm 4	8 \pm 6	
AF-AT recurrence (%)	57,1%	78,6%	
Redo procedures (%)	12,9%	8,6%	

Complications

	Non-CF Group (n=70)	CF Group (n=70)
Groin-site complications	0	0
Tamponade	1	0
Stroke	0	0
TIA	0	0
Clinical PV stenosis	0	0
AE fistula	0	0
Total	1(1,4%)	0



AF Ablation with Contact Force(CF) vs Non-CF Catheters

Acute effectiveness in PVI

	Non-CF Group (n=70)	CF Group (n=70)	P
Total PVs	282	283	
Anatomical variations (n)	8	7	
Left common PVs (n)	5	4	
Right middle PV (n)	2	3	
Other variations (n; patients)	1	0	
Acutely isolated PVs (n,%)	99,3%	100%	
PVs subjected to Adenosine test	232	238	
PVs with dormant conduction (n,%)	32 (14%)	5 (2,1%)	



Regular atrial tachycardias following pulmonary vein isolation for paroxysmal atrial fibrillation: a retrospective comparison between the cryoballoon and conventional focal tip radiofrequency techniques

Justo Juliá · Gian-Battista Chierchia · Carlo de Asmundis · Giacomo Mugnai · Juan Sieira · Giuseppe Ciconte · Giacomo Di Giovanni · Giulio Conte · Giannis Baltogiannis · Yukio Saitoh · Kristel Wauters · Ghazala Irfan · Pedro Brugada

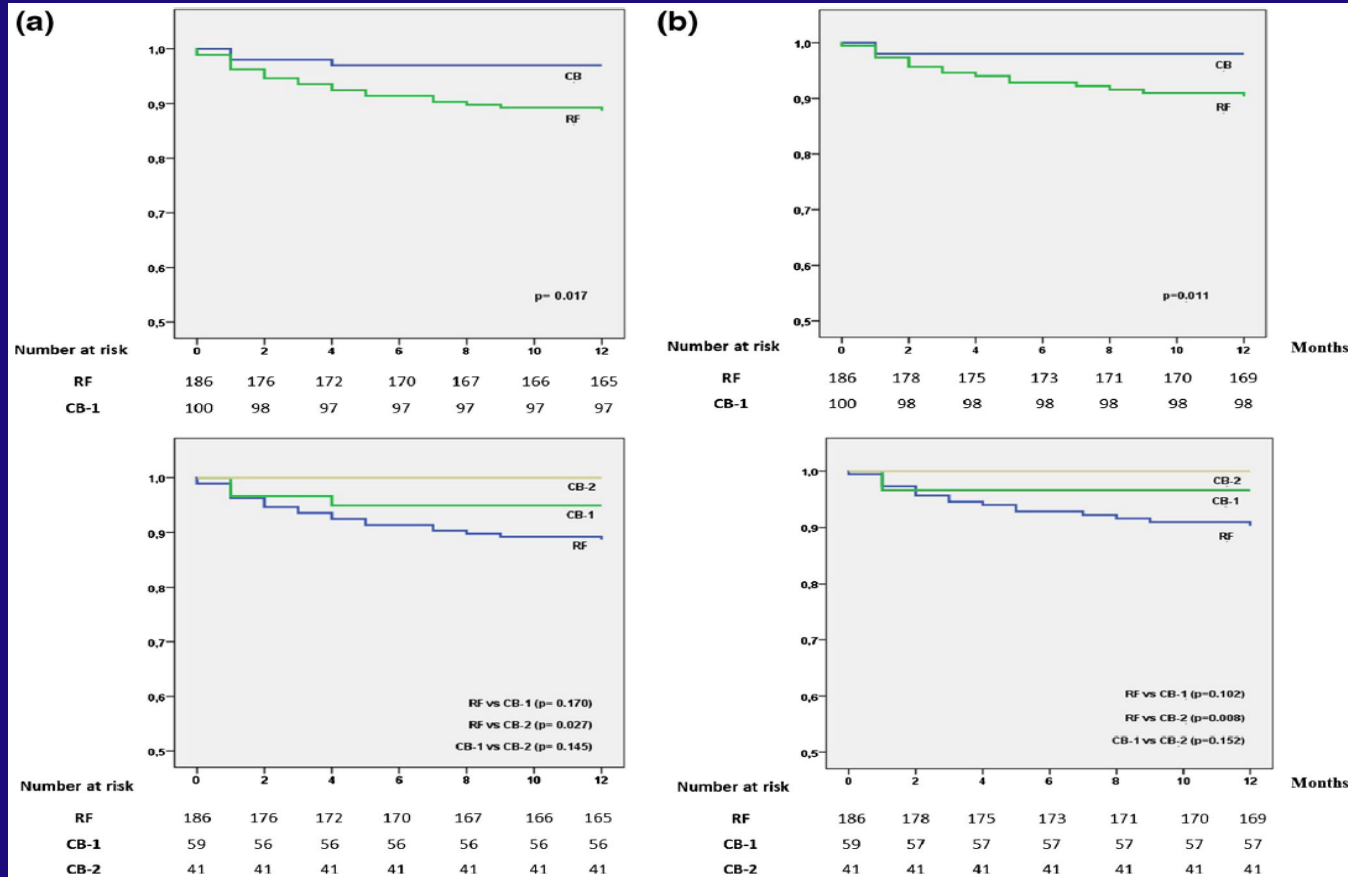
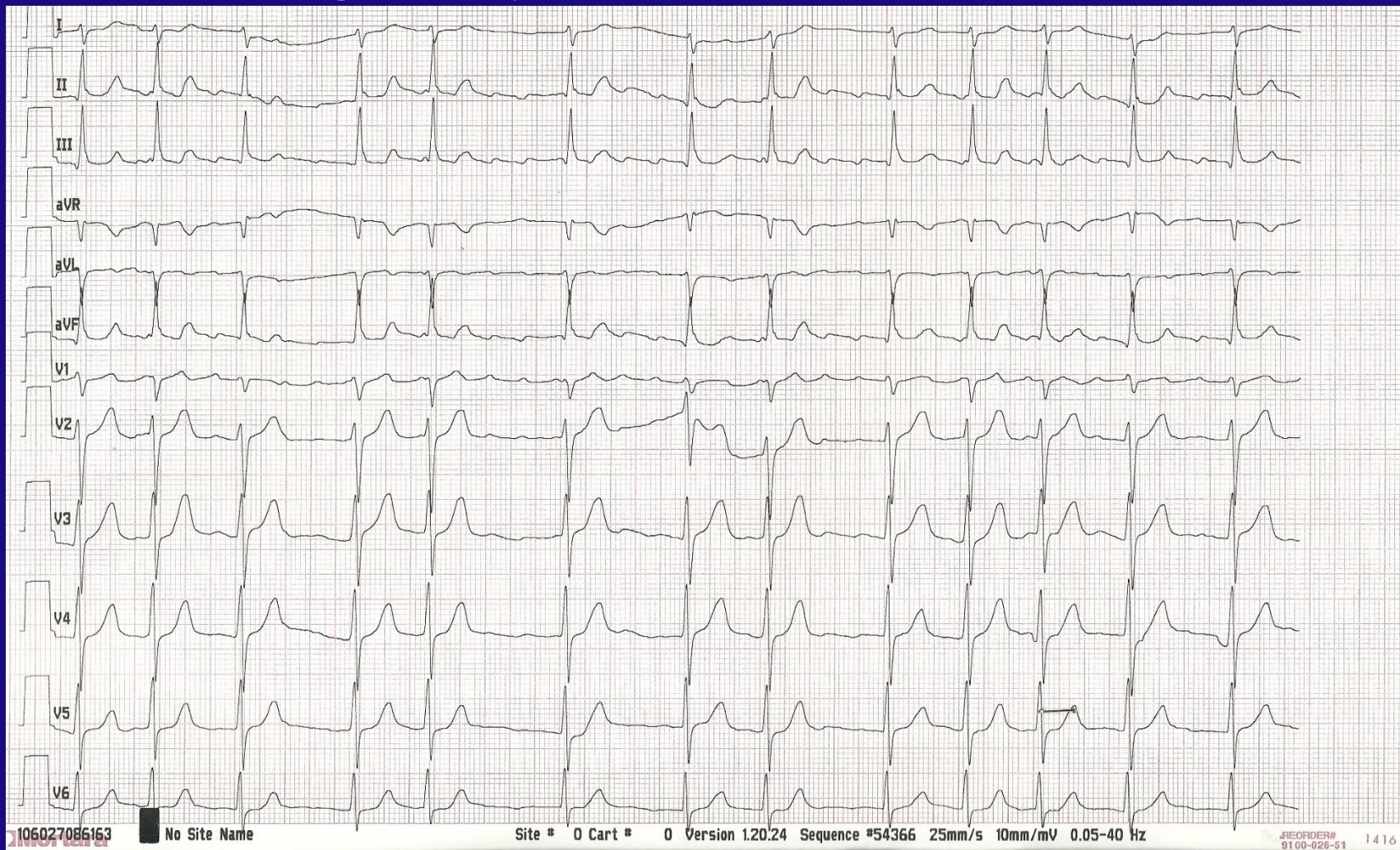


Fig. 1 Kaplan-Meier for survival free of all ATs (a) and ATs excluding common right atrial flutter (b) for RF and CB groups (up) and RF, CB-1, and CB-2 groups (down)

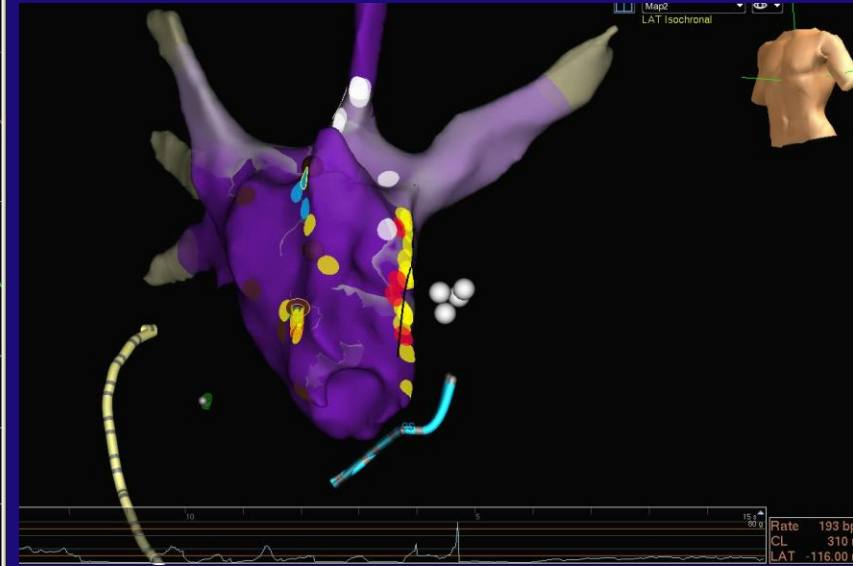
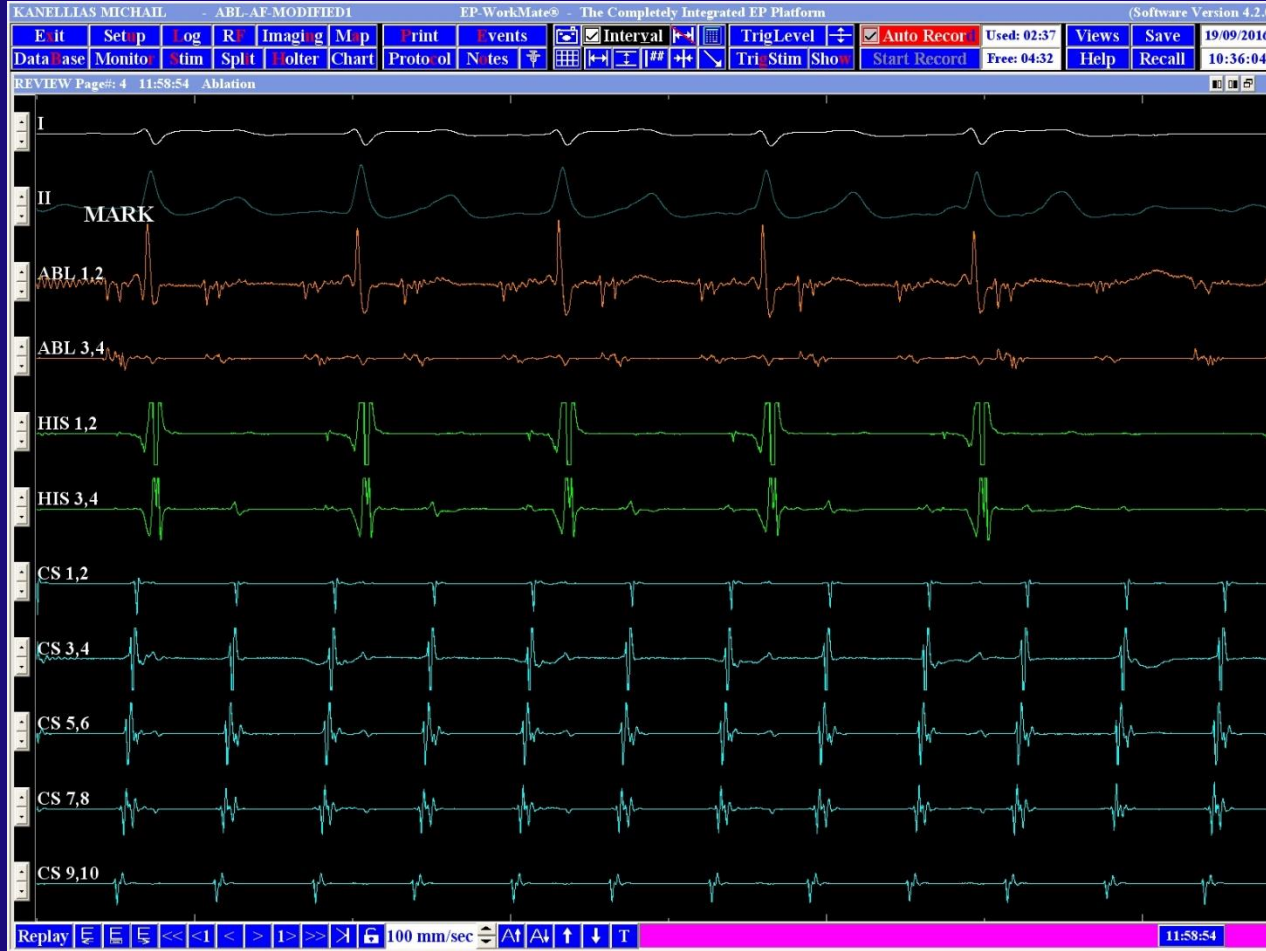


- 56 year-old man with arterial hypertension and a 4-year history of paroxysmal AF
- 1st RF ablation with PVI (Feb 2016)
- Relapse (Aug 2016): symptomatic atrial flutter with rapid AV conduction





Counterclockwise peri-mitral left atrial flutter

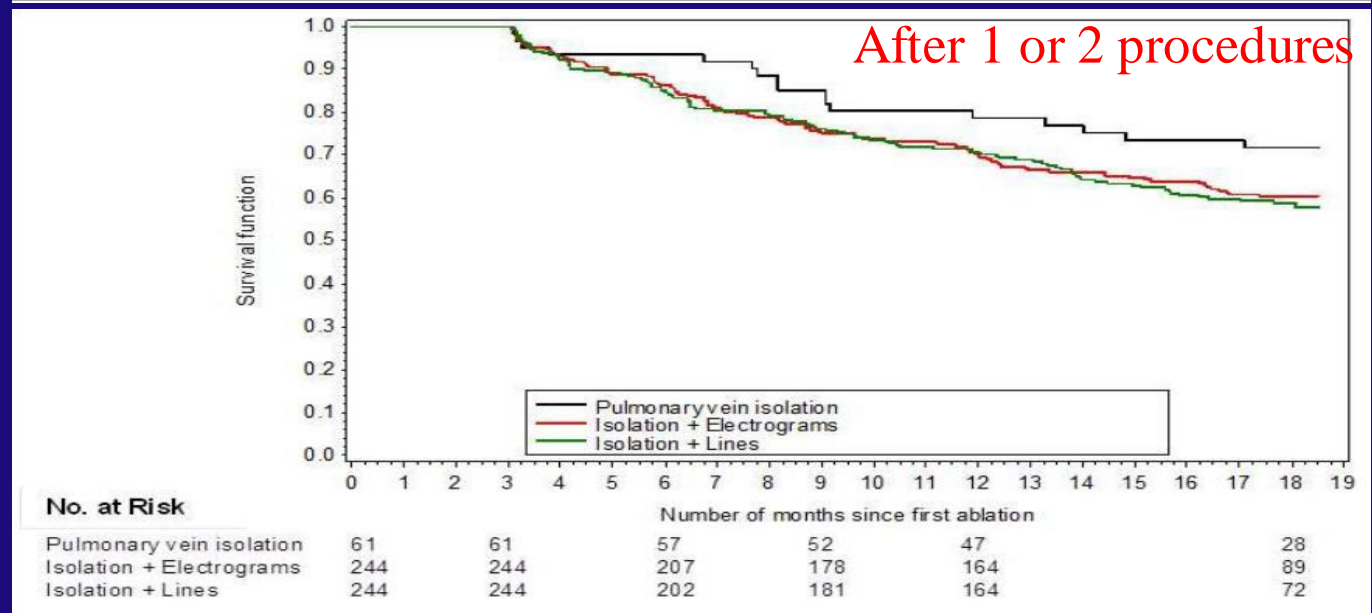
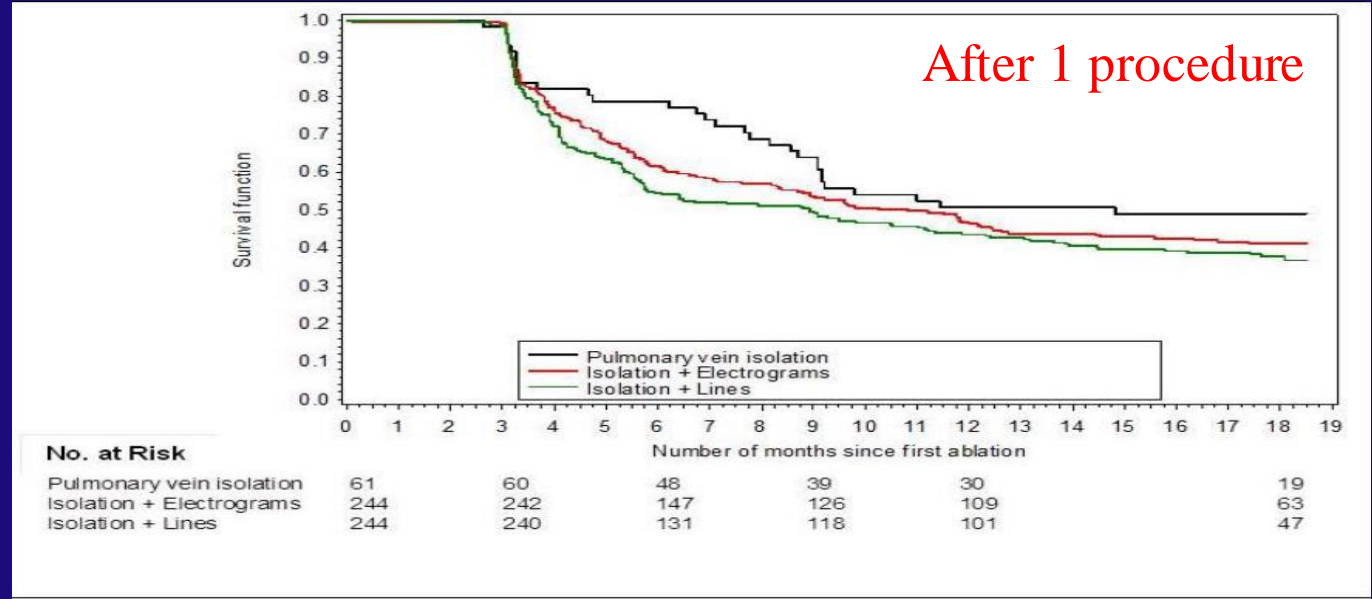
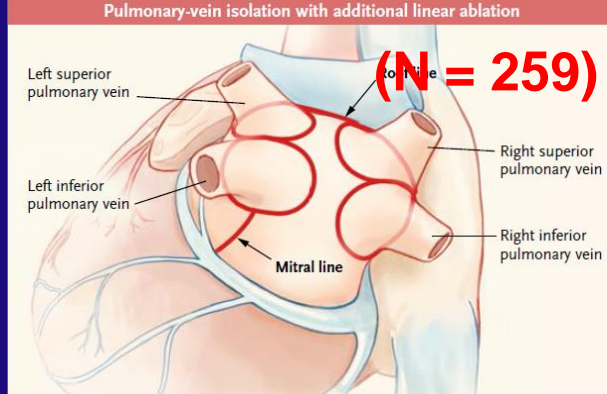
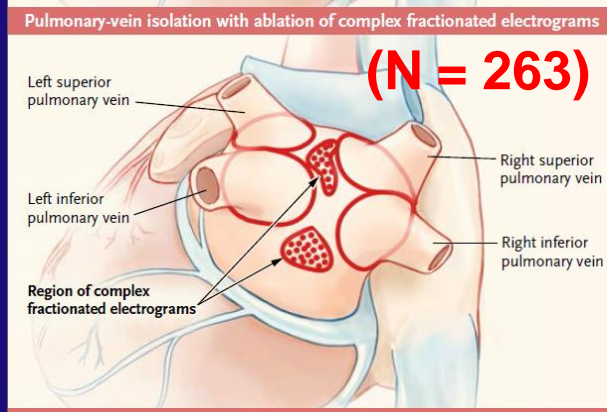
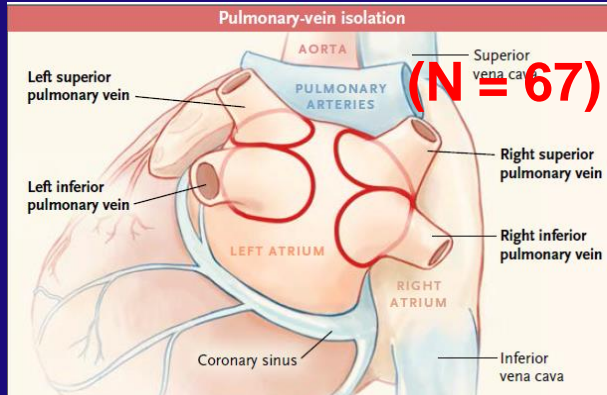




Back-up Slides

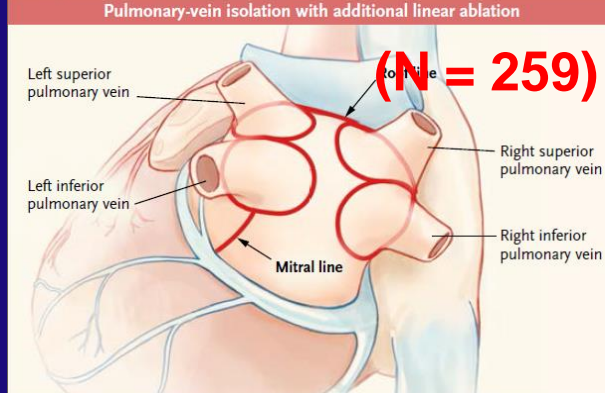
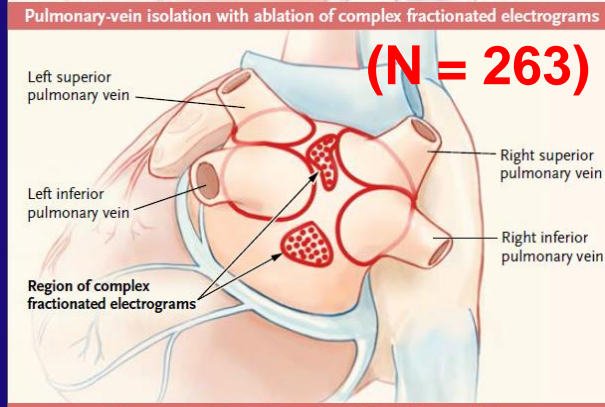
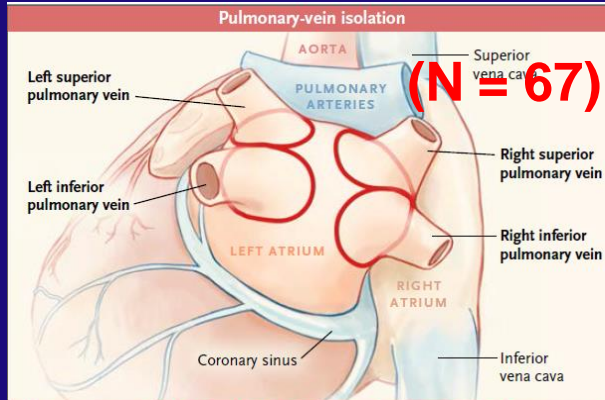


What's the most appropriate Treatment for Persistent AF? STAR AF II Trial





What's the most appropriate Treatment for Persistent AF? STAR AF II Trial



Procedural details

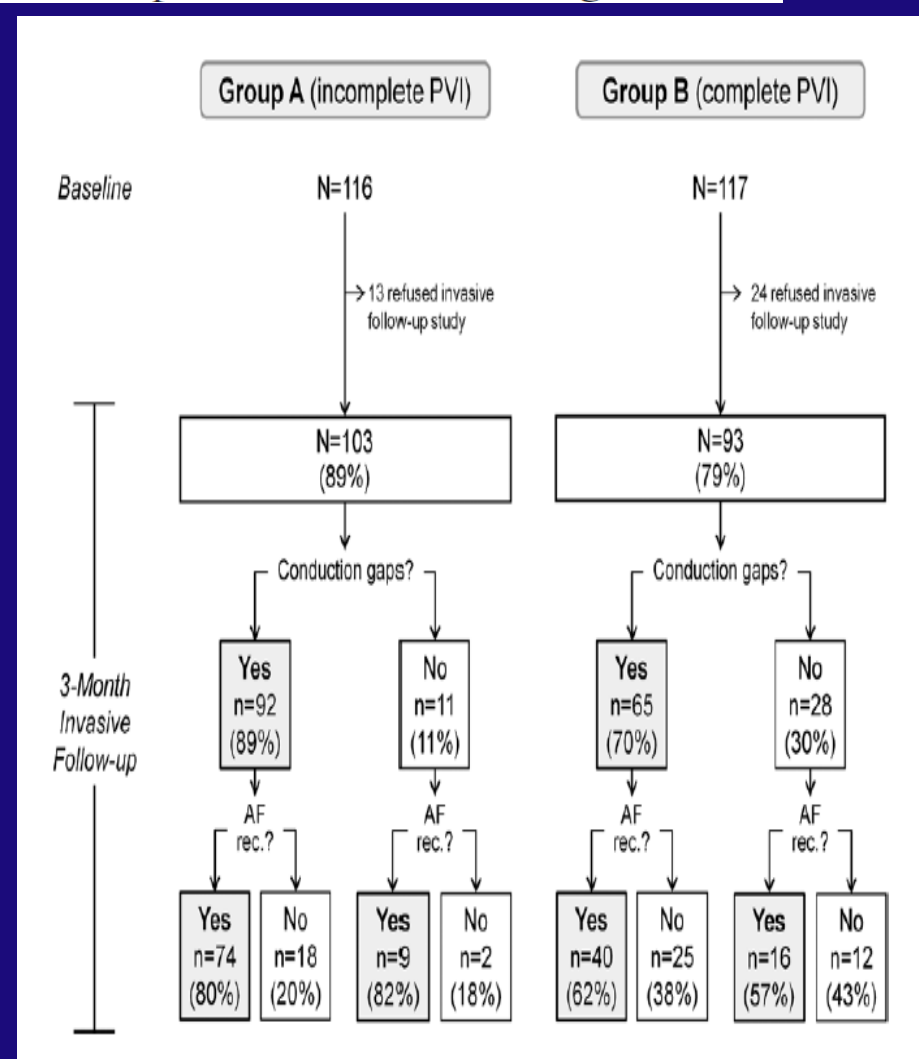
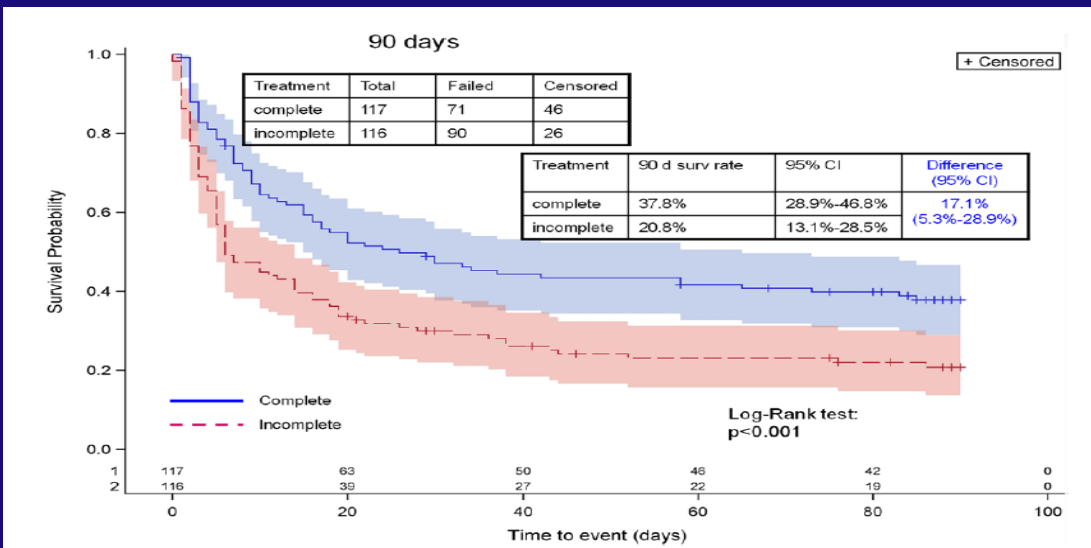
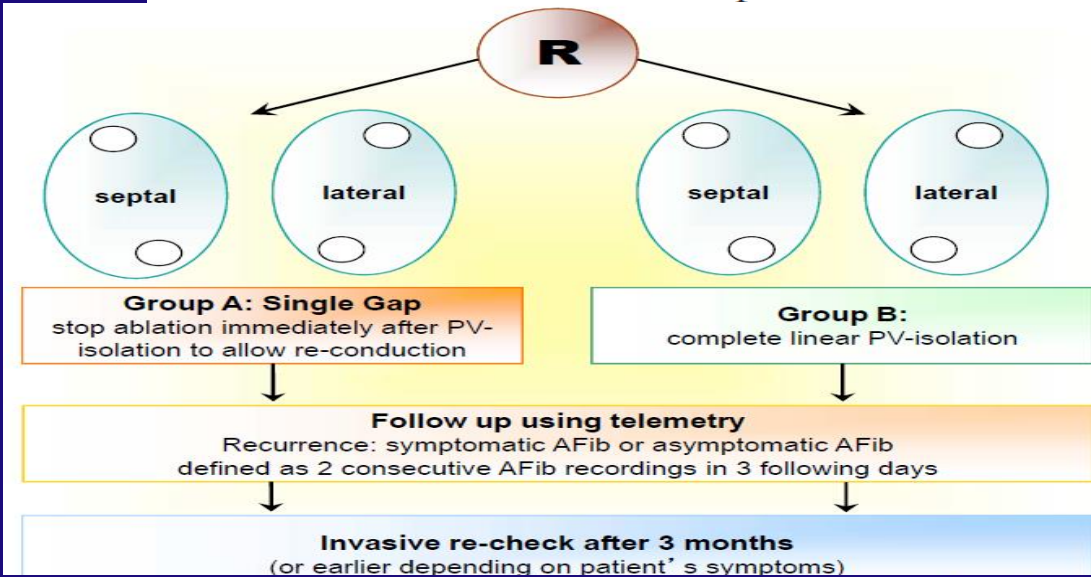
	Isolation alone	Isolation+electrograms	Isolation+lines	p value
Procedure time (min)*	167 ± 55	229 ± 83	223 ± 89	<0.001
Mapping time (min)*	14 ± 7	19 ± 14	14 ± 8	<0.001
Fluoroscopy time (min)*	29 ± 16	42 ± 21	41 ± 25	<0.001
Acute AF termination during procedure (%)*	8%	45%	22%	<0.001
Patients receiving successful linear ablation with conduction block (%)*	-	-	Roof line 231 (93%) Mitral line 187 (75%) Both lines 184 (74%)	-
Crossover during first procedure*	1 Total 1 isolation+lines	6 Total 2 isolation alone 2 isolation+lines 2 isolation+electrograms+lines	1 Total 1 isolation+electrograms+lines	0.16
Patients receiving a second ablation procedure (%)	14 (22%)	67 (26%)	83 (33%)	0.10
Crossover during second procedure	4 total 4 isolation+electrograms	15 total 2 isolation alone 5 isolation+lines 8 isolation+electrograms+lines	3 total 3 isolation+electrograms+lines	<0.001



Impact of Complete Versus Incomplete Circumferential Lines Around the Pulmonary Veins During Catheter Ablation of Paroxysmal Atrial Fibrillation

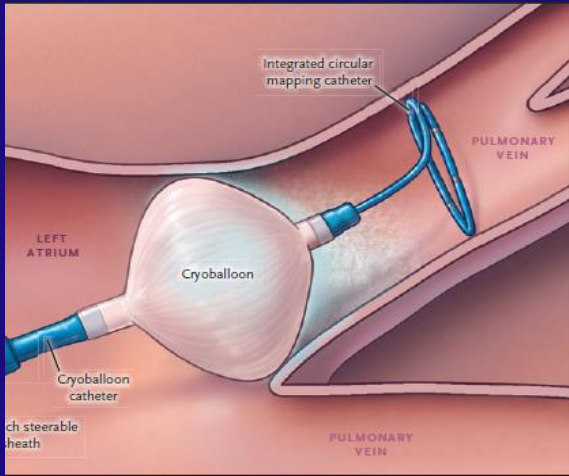
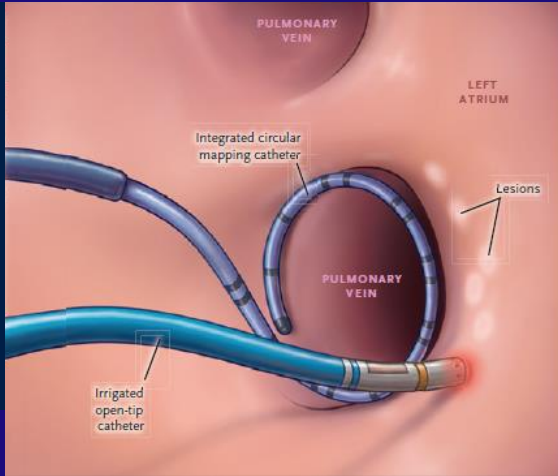
Results From the Gap-Atrial Fibrillation–German Atrial Fibrillation Competence Network 1 Trial

Karl-Heinz Kuck, MD; Boris A. Hoffmann, MD; Sabine Ernst, MD; Karl Wegscheider, PhD; Andras Treszl, MD; Andreas Metzner, MD; Lars Eckardt, MD; Thorsten Lewalter, MD; Günter Breithardt, MD; Stephan Willems, MD; for the Gap-AF–AFNET 1 Investigators*





**FIRE
AND
ICESM**
AF Ablation Clinical Trial



	Acute PV isolation success rate	
	RF Group	Cryo Group
Left common PVs	77% (30/39)	100% (28/28)
Right middle PV	48% (11 of 23)	92% (12/13)
All PVs	97.9%	98.9%



One-year follow-up after second-generation cryoballoon ablation for atrial fibrillation in a large cohort of patients: a single-centre experience

Ghazala Irfan^{1†}, Carlo de Asmundis^{1†}, Giacomo Mugnai¹, Jan Poelaert², Christian Verborgh², Vincent Umbrain², Stefan Beckers², Ebru Hacıoglu¹, Burak Hunuk¹, Vedran Velagic¹, Erwin Stroker¹, Pedro Brugada¹, and Gian-Battista Chierchia^{1*}

- 393 patients (122 female (31%) mean age 57.7 ± 12.9 years) with drug-refractory AF
- All 1572 PVs were successfully isolated without focal ablation (100%)
- At a mean follow-up of 12 months, freedom from ATas after a single procedure was achieved in 85.8% of patients with paroxysmal atrial fibrillation and in 61.3% of patients with persistent AF