

# HOT TOPICS IN CARDIOLOGIA 2024

**27 e 28 Novembre 2024**

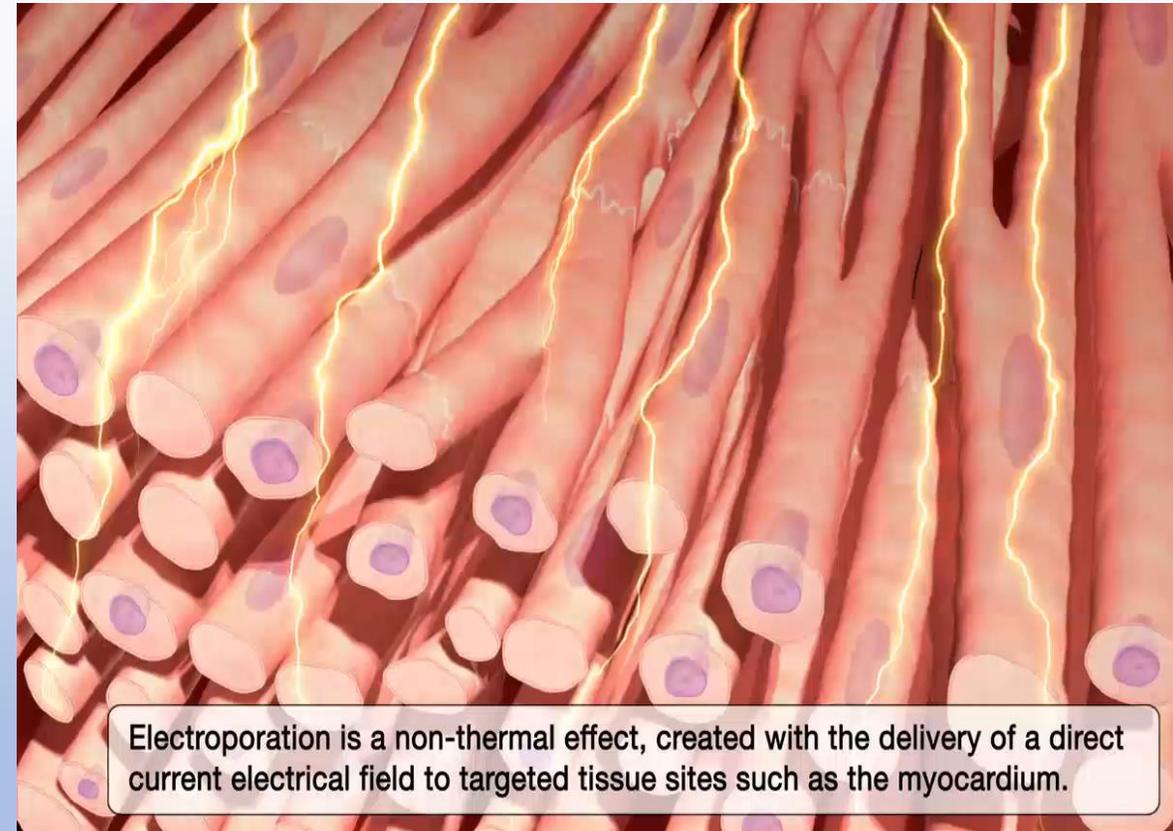
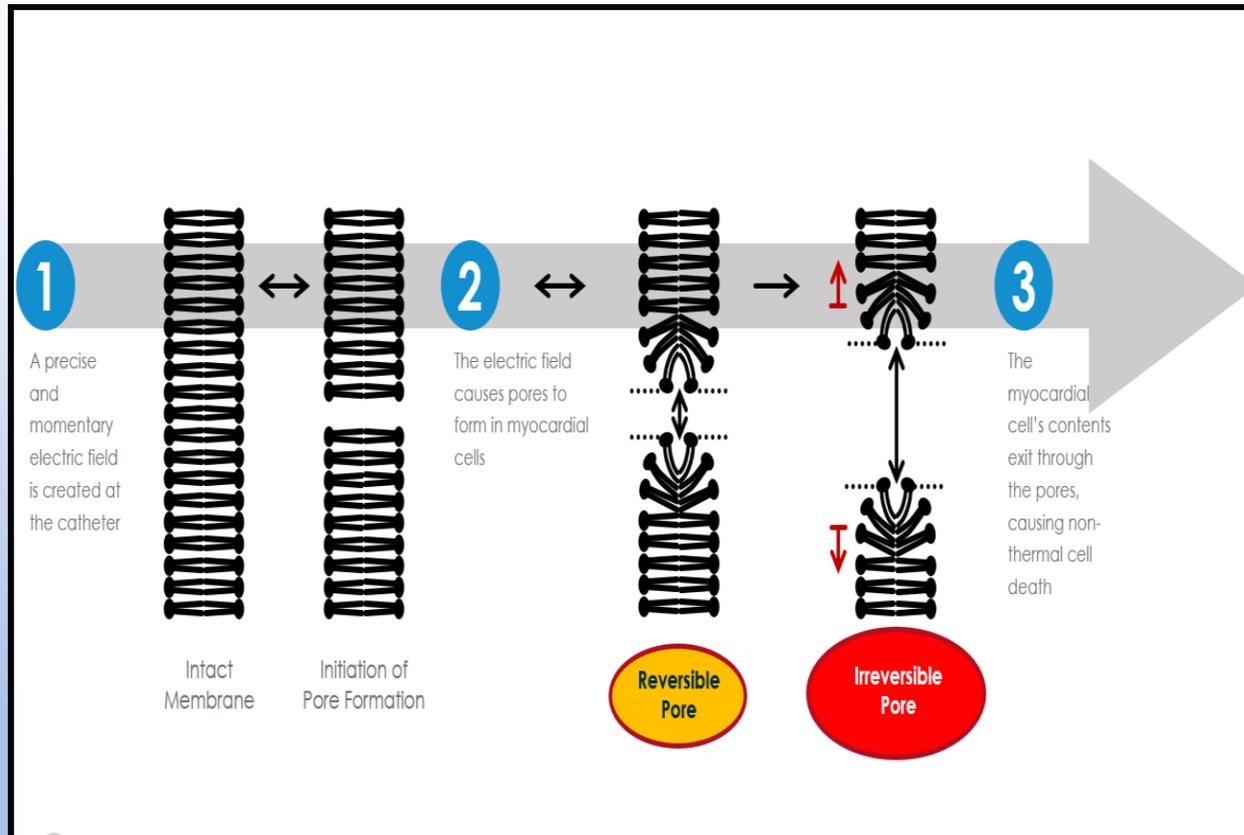
Villa Doria D'Angri - Via F. Petrarca 80,  
Napoli

## **ELETTROPORAZIONE NELL'ABLAZIONE DELLA FIBRILLAZIONE ATRIALE: COSA ABBIAMO IMPARATO DALLA PRATICA CLINICA**

**FRANCESCO SOLIMENE**

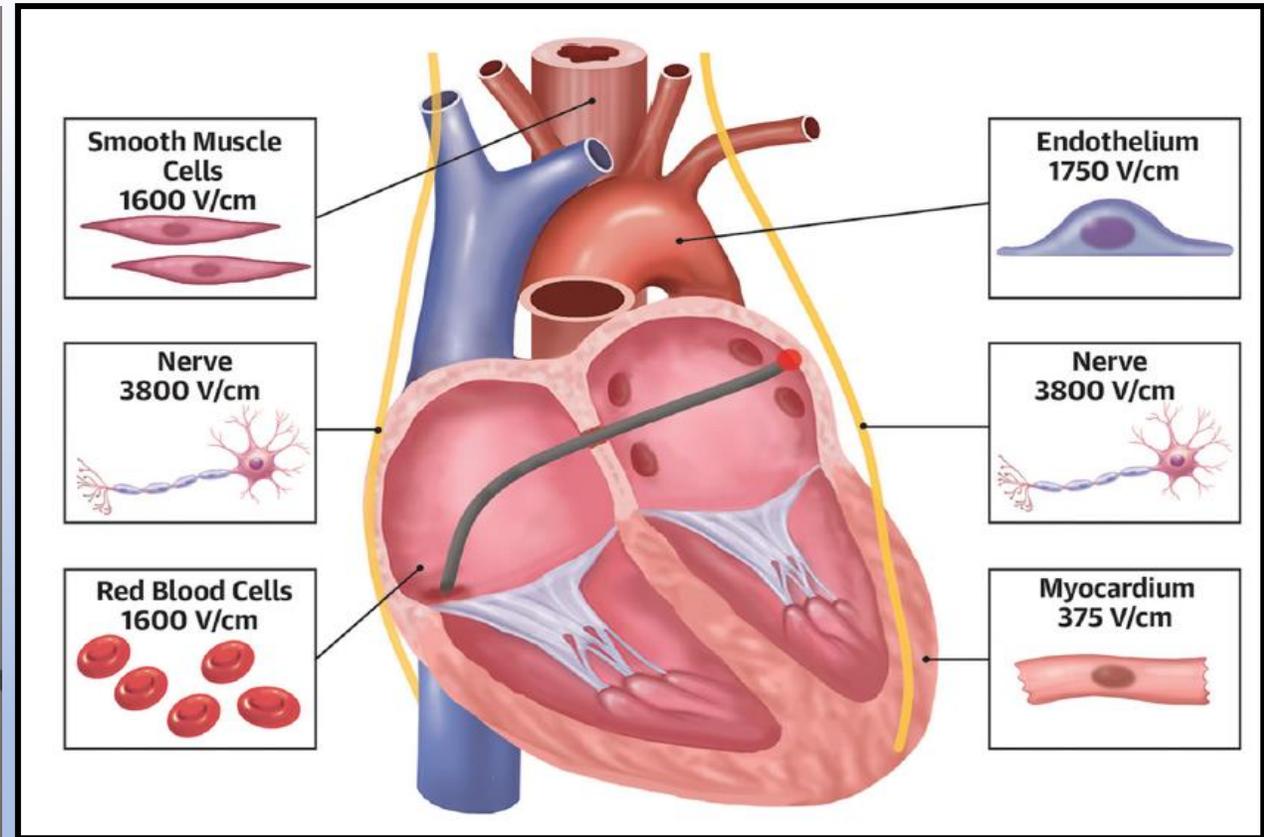
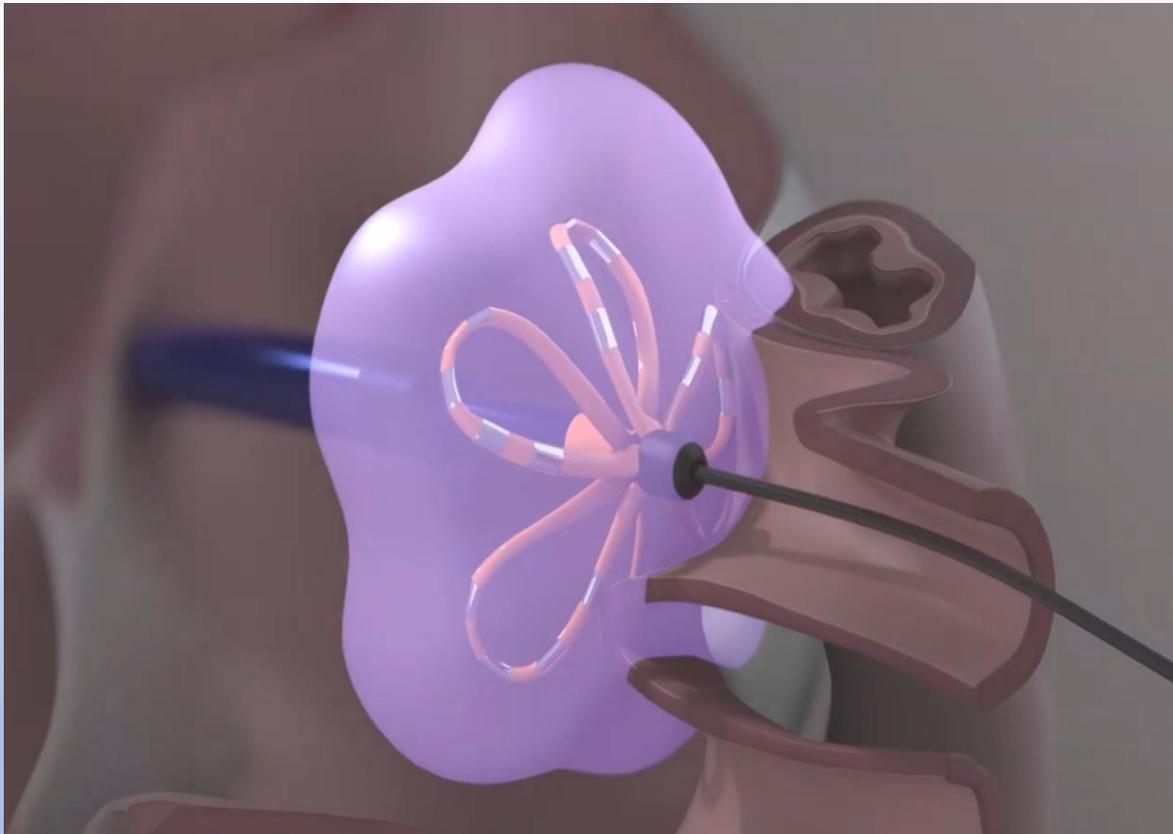
# IL FENOMENO DELL'ELETTROPORAZIONE

## ABLAZIONE A CAMPI PULSATI: EFFETTO SELETTIVO E NON TERMICO



# IL FENOMENO DELL'ELETTROPORAZIONE

## ABLAZIONE A CAMPI PULSATI: EFFETTO SELETTIVO E NON TERMICO



# EVIDENZE DALLA PRATICA CLINICA



# EVIDENZE DALLA PRATICA CLINICA

*Efficacia*

*Efficienza*

*Lezioni  
dalla pratica  
clinica*

*Riproducibilità*

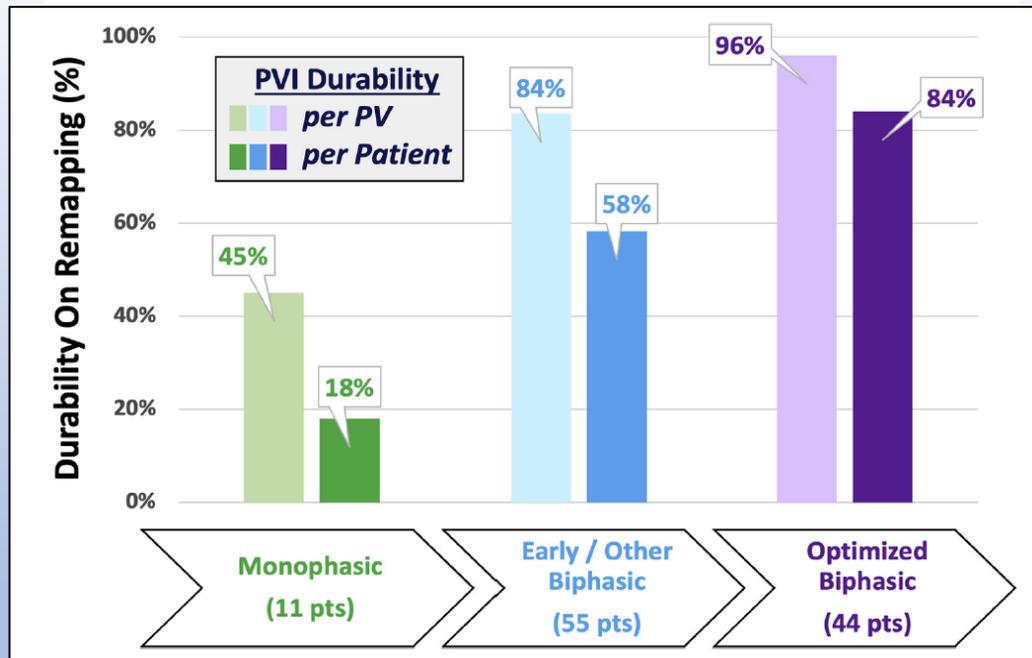
*Sicurezza*

# EFFICACIA: IMPORTANZA DI SEGUIRE IL PROTOCOLLO OTTIMIZZATO

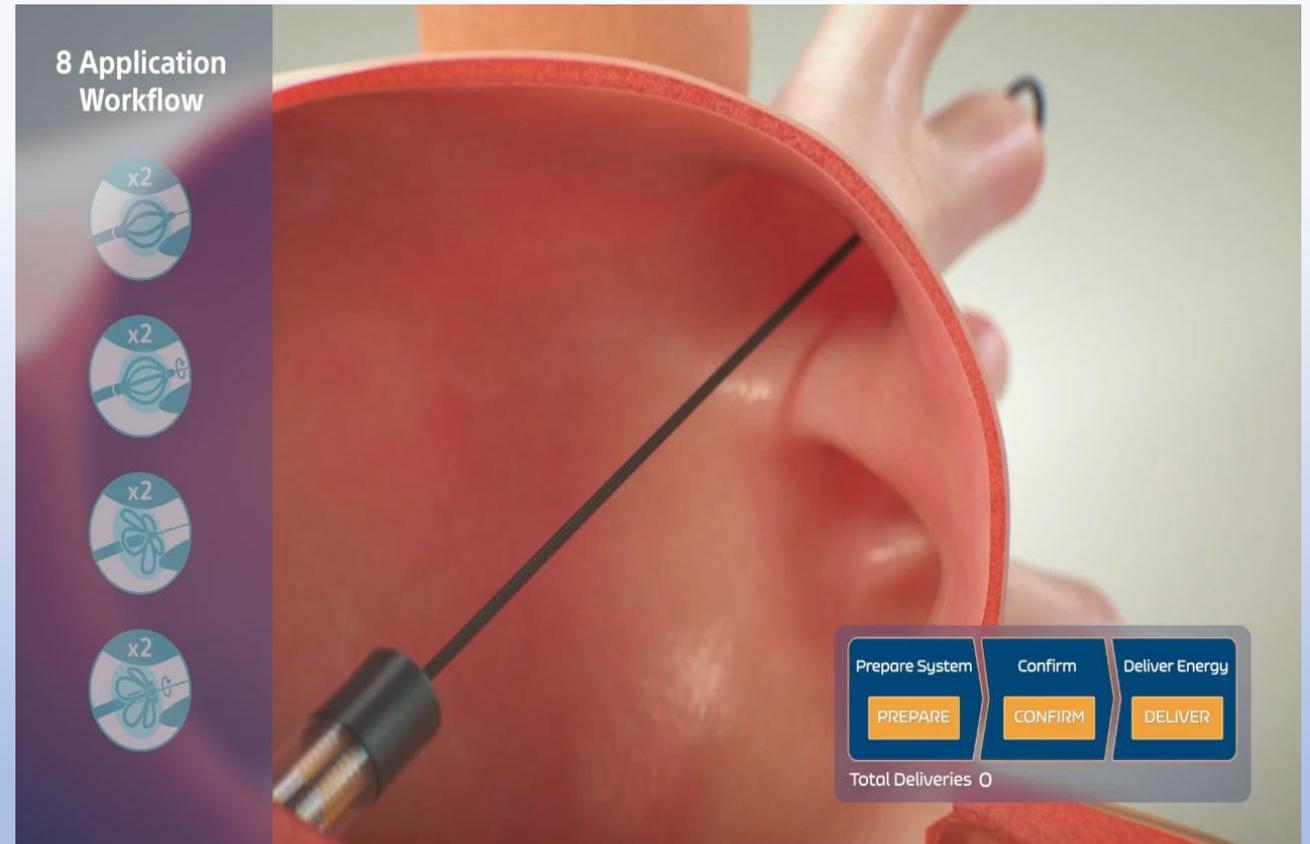
L'UNICO PREDITTORE DI LESIONE DURATURA E' L'ESECUZIONE DEL PROTOCOLLO OTTIMIZZATO

## Pulsed Field Ablation of Paroxysmal Atrial Fibrillation

1-Year Outcomes of IMPULSE, PEFCAT, and PEFCAT II



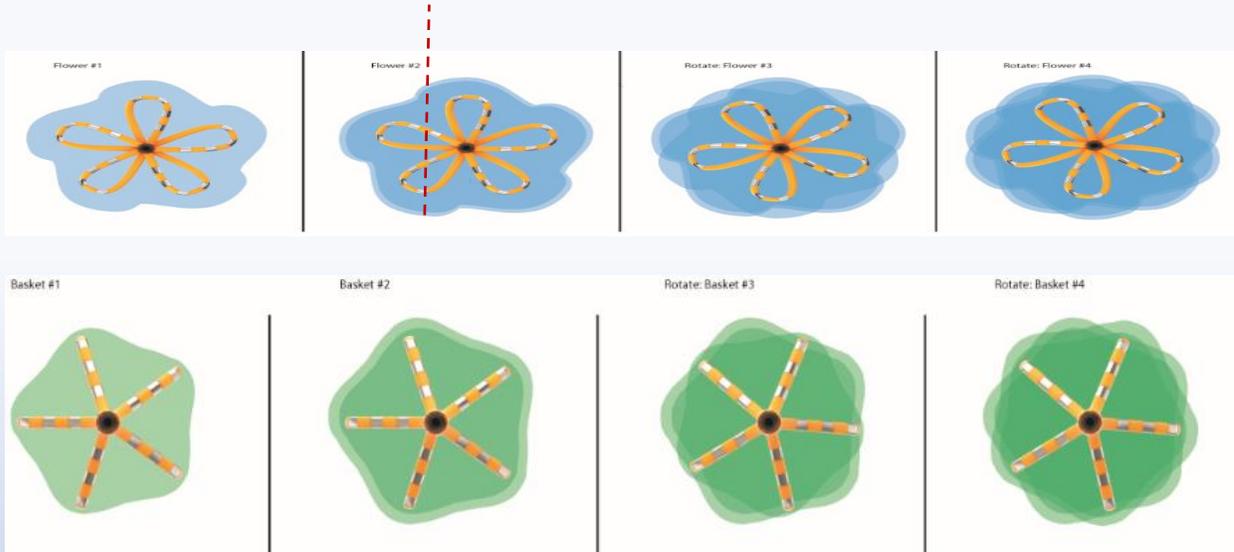
>125 000 pazienti trattati



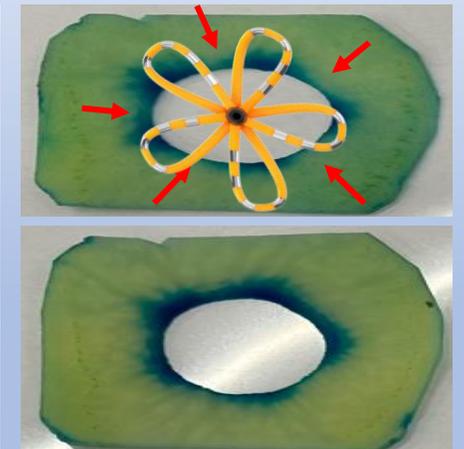
> 130 Pubblicazioni

# RAZIONALE DEL WORKFLOW

## PROTOCOLLO OTTIMIZZATO



## PROTOCOLLO SENZA ROTAZIONE



# EFFICACIA: IMPORTANZA DI SEGUIRE IL PROTOCOLLO OTTIMIZZATO

## CARATTERISTICHE DELLA LESIONE FARAPULSE

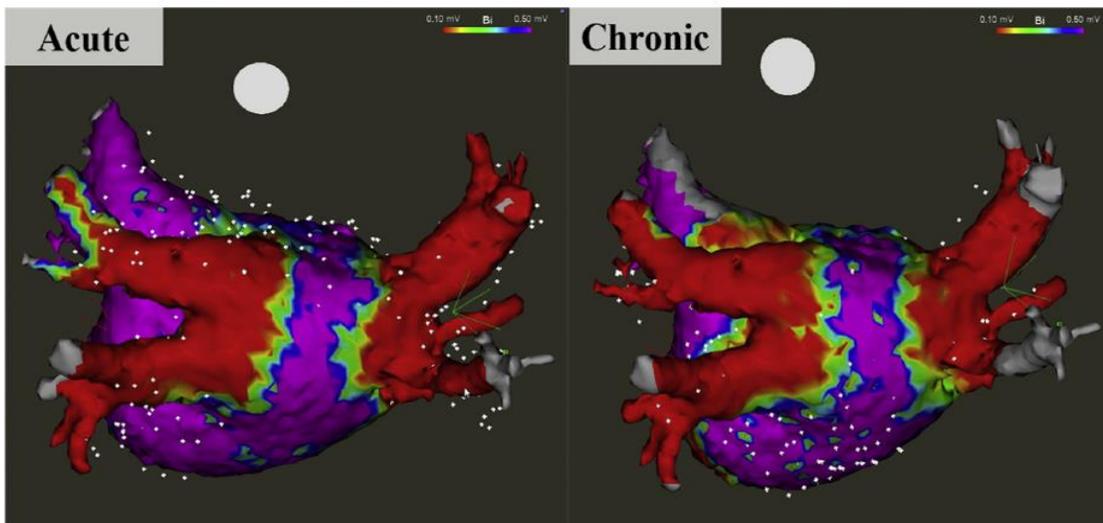
Does pulsed field ablation regress over time? A quantitative temporal analysis of pulmonary vein isolation

Iwanari Kawamura, MD,\* Petr Neuzil, MD, PhD,† Poojita Shivamurthy, MD,\*

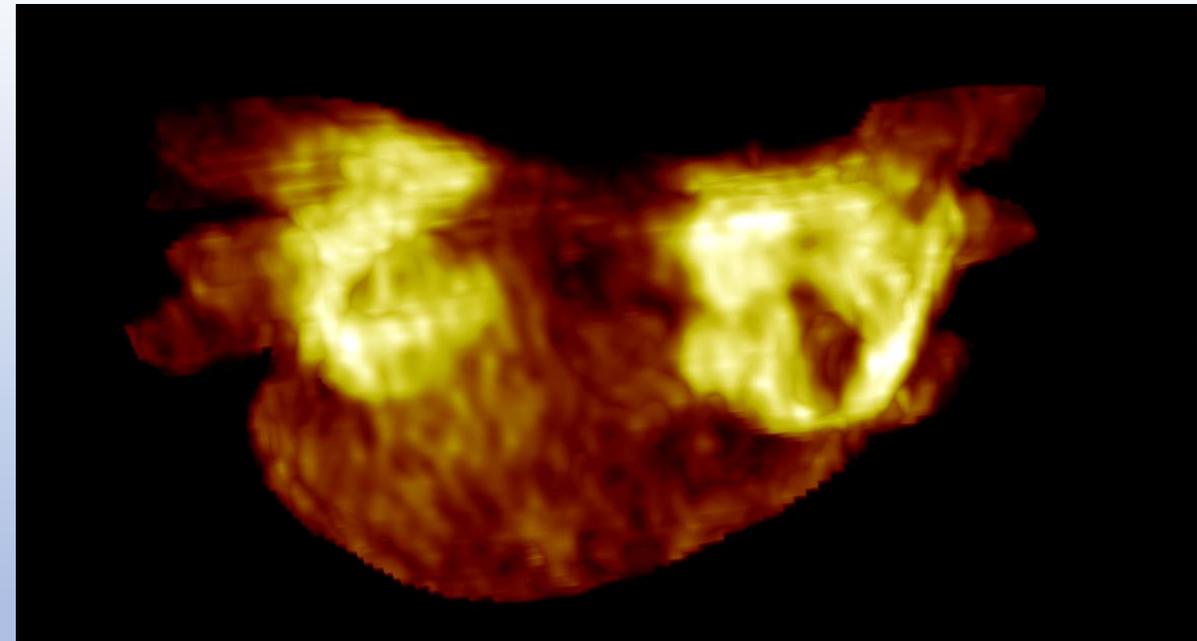
Pulsed field ablation prevents chronic atrial fibrotic changes and restrictive mechanics after catheter ablation for atrial fibrillation

Yosuke Nakatani<sup>1\*</sup>, Soumaya Sridi-Cheniti<sup>2</sup>, Ghassen Cheniti<sup>1</sup>, F. Daniel Ramirez<sup>1</sup>, Cyril Goujeau<sup>1</sup>, Clementine André<sup>1</sup>, Takashi Nakashima<sup>1</sup>, Charles Eggert<sup>3</sup>, Christopher Schneider<sup>3</sup>, Raju Viswanathan<sup>3</sup>, Philipp Krisai<sup>1</sup>, Takamitsu Takagi<sup>1</sup>, Tsukasa Kamakura<sup>1</sup>, Konstantinos Vlachos<sup>1</sup>, Nicolas Derval<sup>1,4</sup>, Josselin Duchateau<sup>1,4</sup>, Thomas Pambrun<sup>1,4</sup>, Remi Chauvel<sup>1,4</sup>, Vivek Y. Reddy<sup>5</sup>, Michel Montaudon<sup>2,4</sup>, François Laurent<sup>2,4</sup>, Frederic Sacher<sup>1,4</sup>, Méléze Hocini<sup>1,4</sup>, Michel Haïssaguerre<sup>1,4</sup>, Pierre Jaïs<sup>1,4</sup>, and Hubert Cochet<sup>2,4</sup>

### Durability



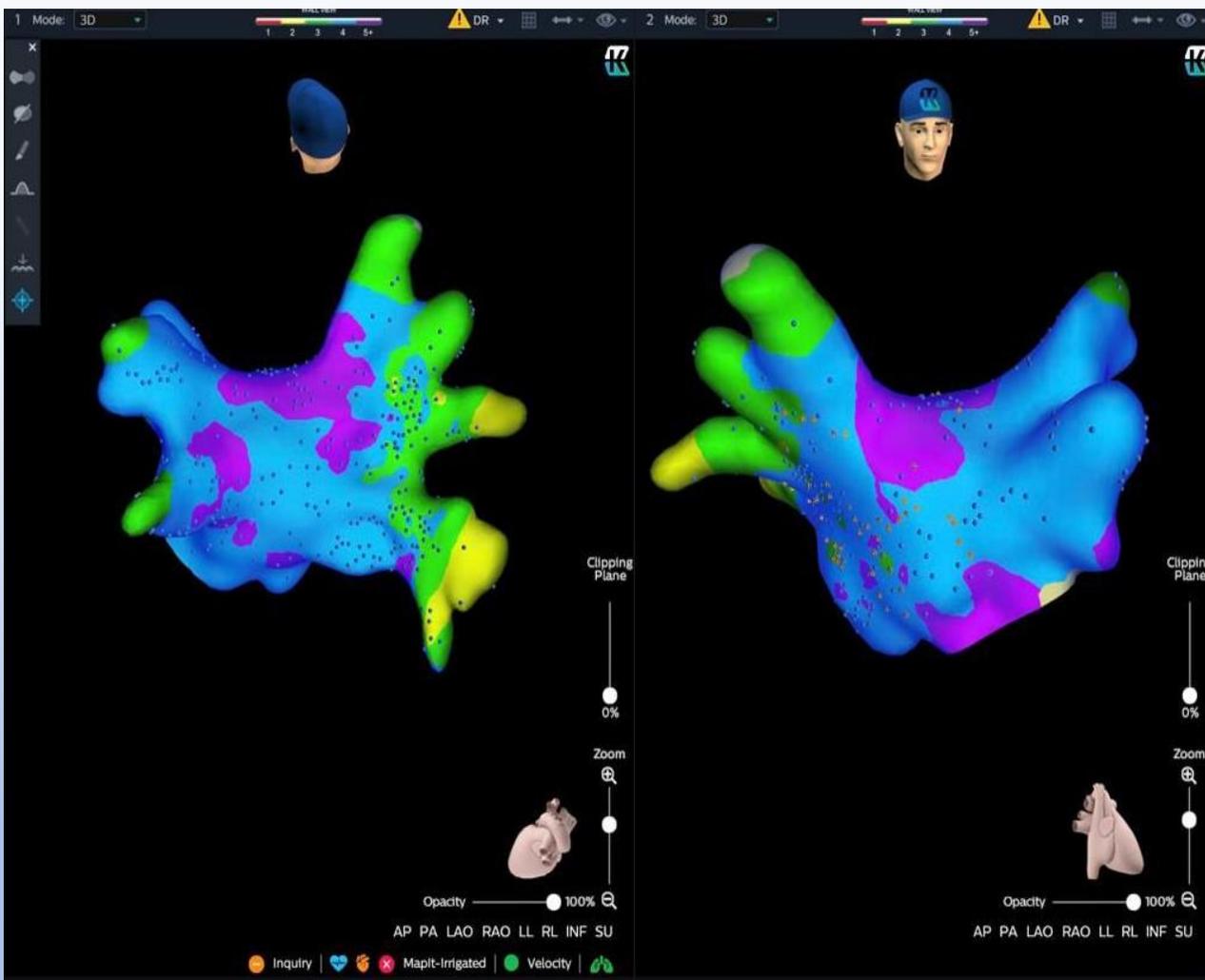
LA LESIONE NON REGREDISCE DOPO 3 MESI



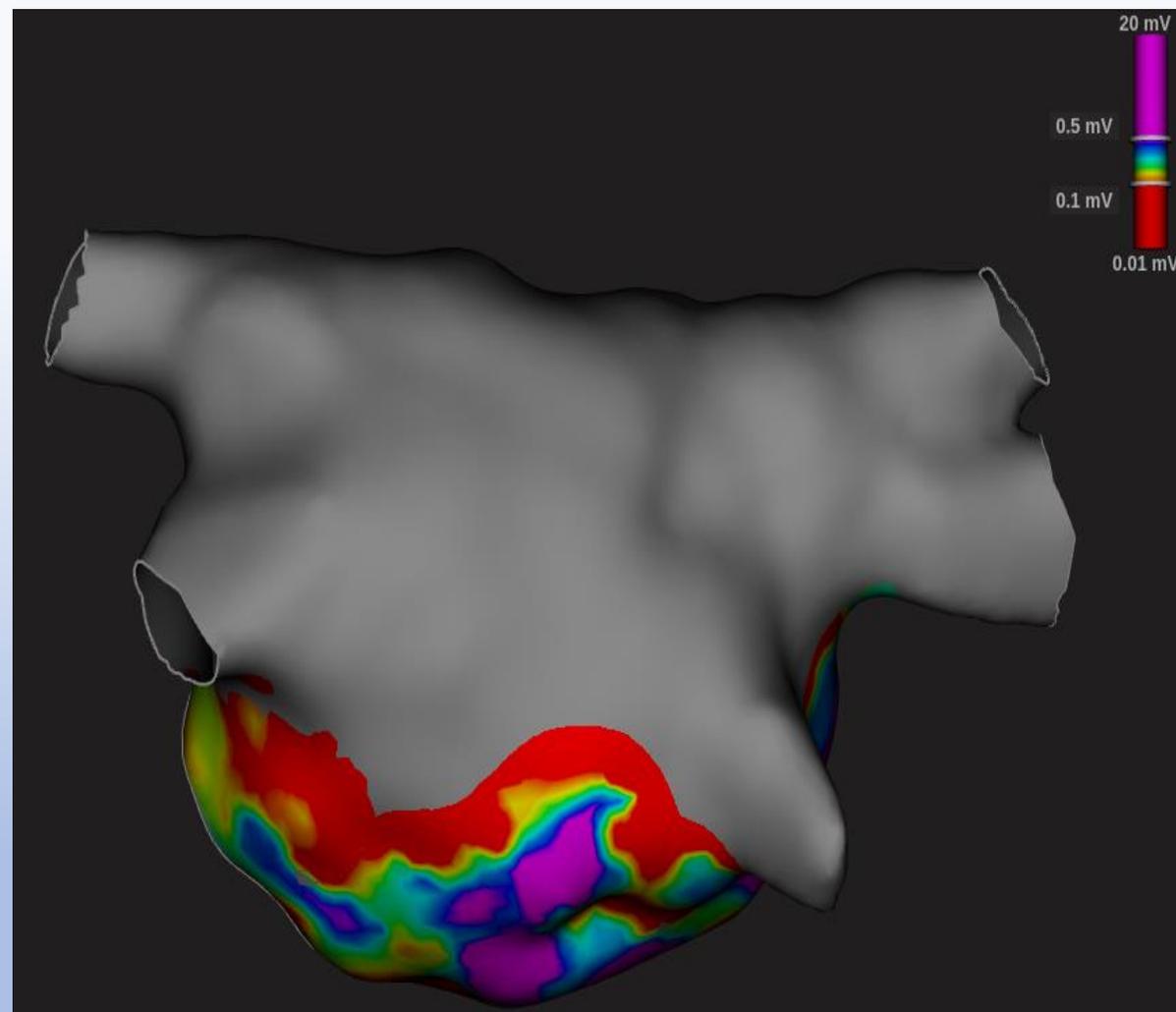
LA LESIONE HA AMPIO VOLUME ANTRALE

# EFFICACIA:EFFETTO DURATURO

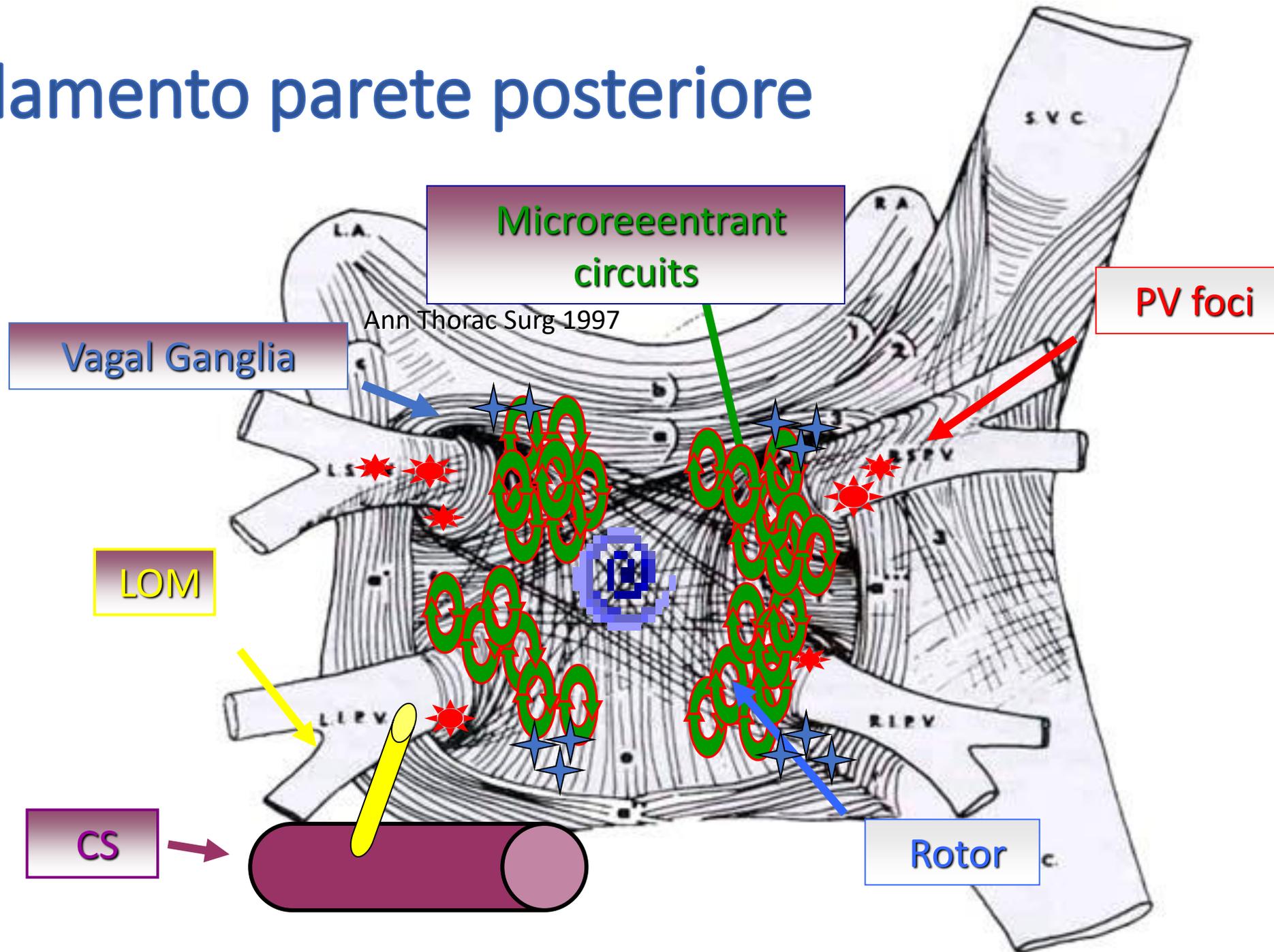
## MAPPA DI SPESSORE



## REMAP AD 8 MESI

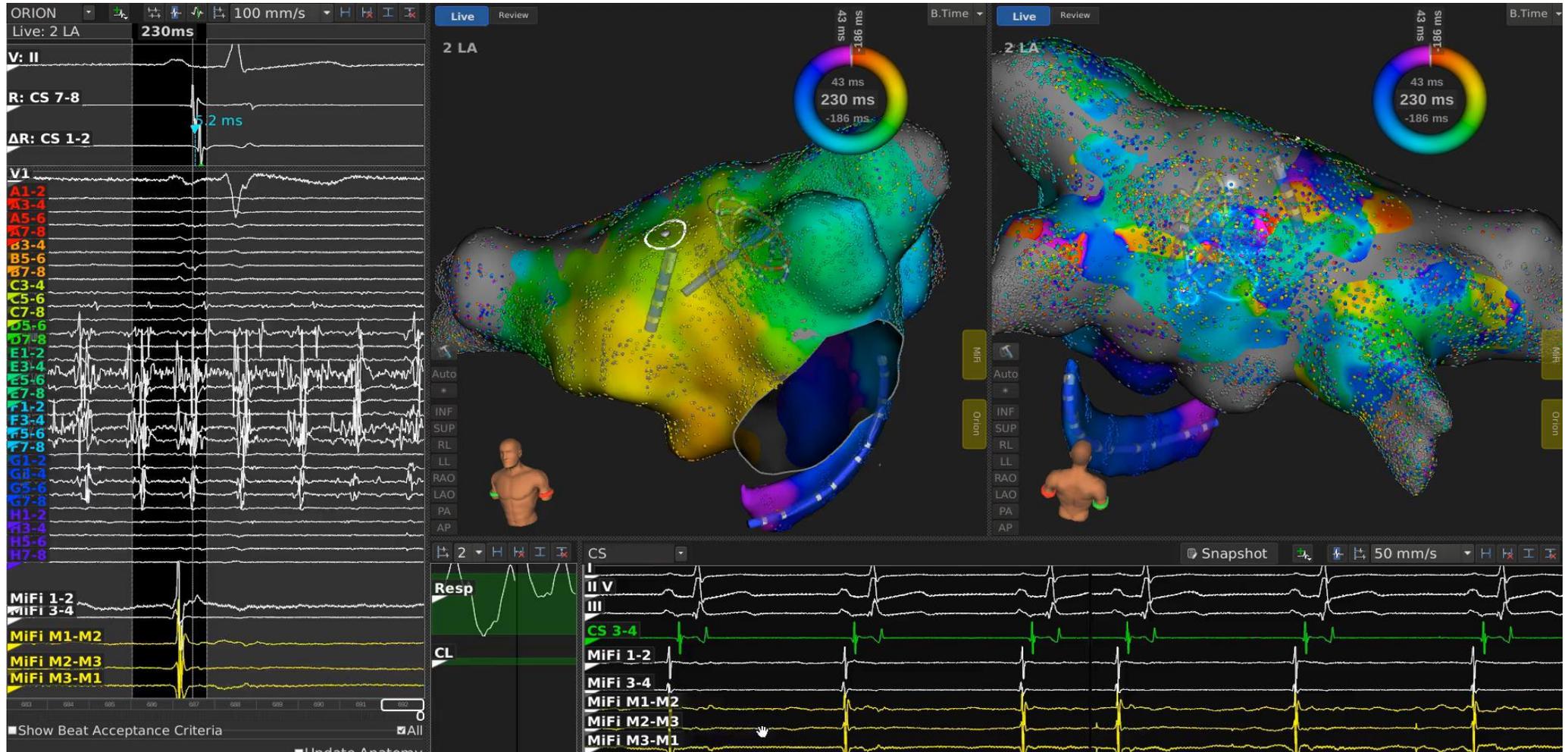


# Isolamento parete posteriore

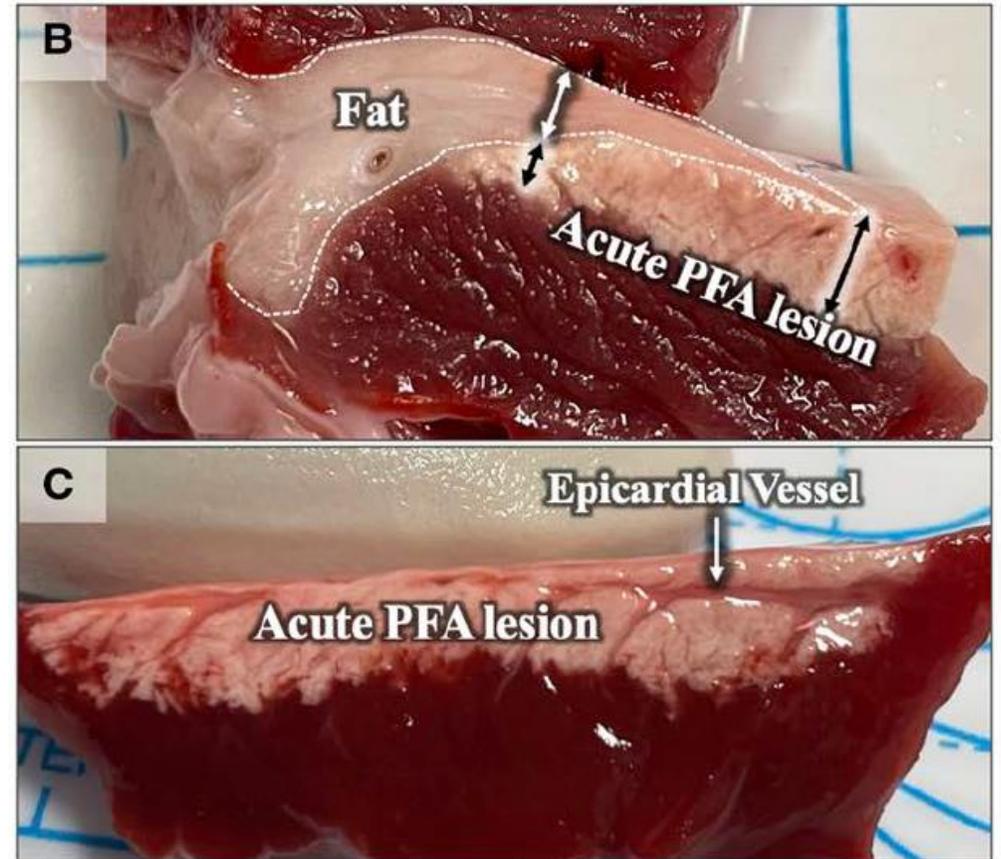
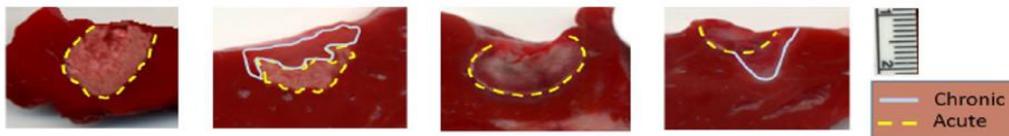
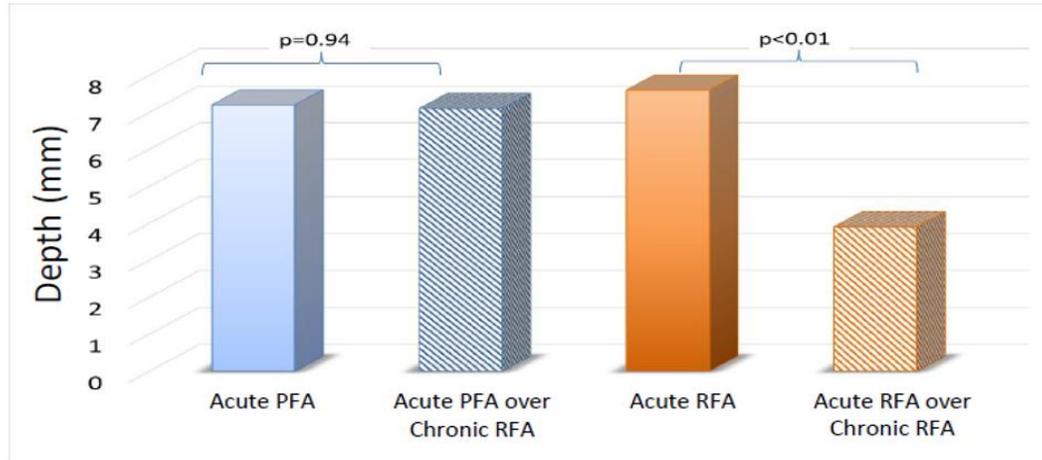
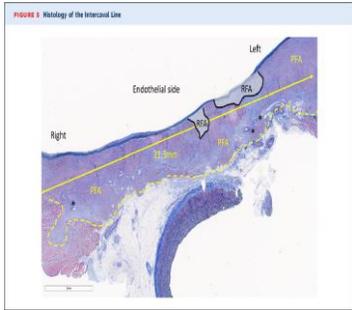


# Aritmogenicità parete posteriore in FA persistente

ATRIO IN SINUSALE E PARETE POSTERIORE ISOLATA IN FA



# QUALE E' LA MIGLIORE ENERGIA PER L'ISOLAMENTO DELLA PARETE POSTERIORE E PER I REDO?



# ABLAZIONE CON PFA DELLA PARETE POSTERIORE NEI PERSISTENTI: EFFICACIA

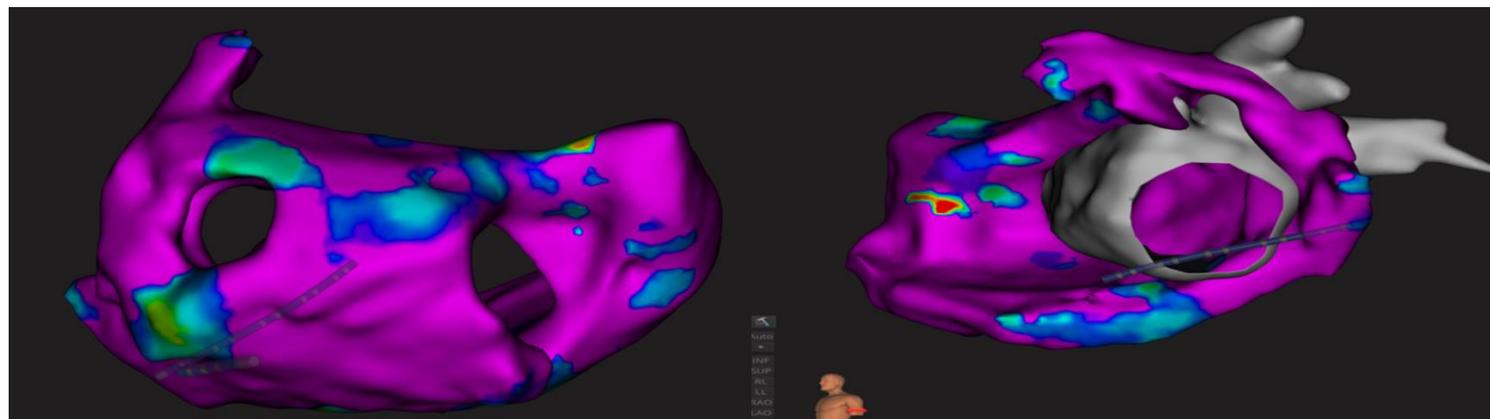


## RESEARCH LETTER

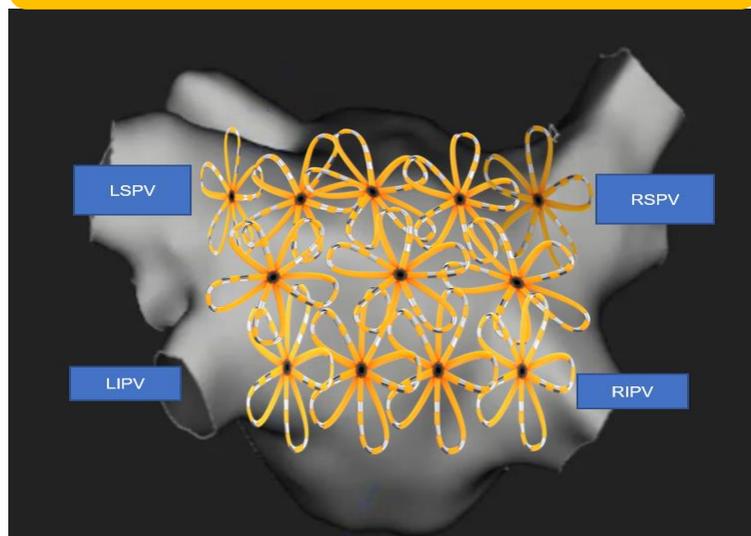
### Direct Epicardial Validation of Posterior Wall Electroporation in Persistent Atrial Fibrillation

Francesco Solimene, MD<sup>a,b,‡</sup>  
\*Paolo Compagnucci, MD, PhD<sup>c,‡</sup>  
Claudio Tondo, MD, PhD<sup>d,e</sup>  
Vincenzo Mirco La Fazia, MD<sup>f</sup>  
Vincenzo Schillaci, MD<sup>a</sup>  
Sanghamitra Mohanty, MD, MS<sup>f</sup>  
Laura Cipolletta, MD, PhD<sup>c</sup>  
Gaetano Michele Fassini, MD<sup>d</sup>  
Paola Chiariello, MD<sup>g</sup>  
Gaetano Mottola, MD<sup>a</sup>  
†Marco Schiavone, MD<sup>d,h</sup>  
Michela Casella, MD, PhD<sup>b,c</sup>  
Antonio Dello Russo, MD, PhD<sup>b,c</sup>  
Andrea Natale, MD<sup>b,f,h</sup>

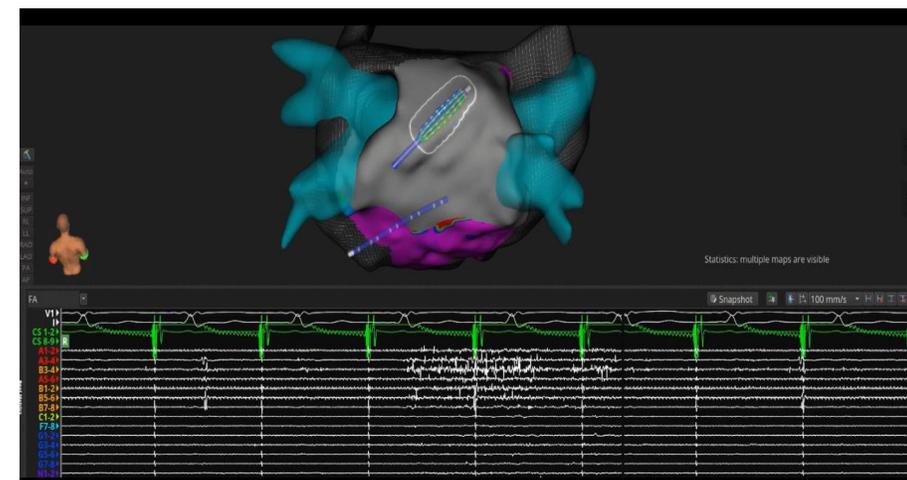
## MAPPA ENDO EPI PREABLAZIONE



## ABLAZIONE SOLO ENDO



## MAPPA EPI POST ABLAZIONE



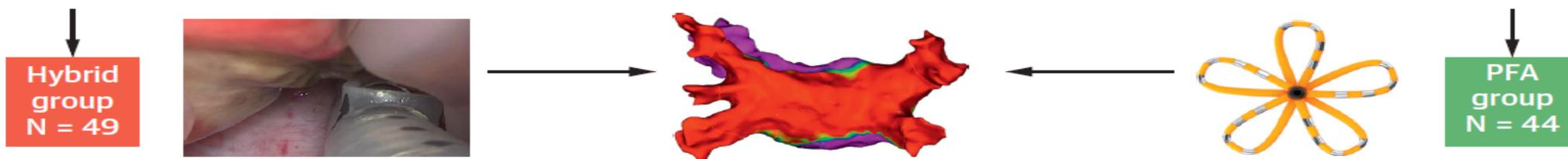
# PVI PIU' PARETE POSTERIORE: FARAPULSE vs IBRIDA

## Hybrid-Convergent Procedure or Pulsed Field Ablation in Long-Standing Persistent Atrial Fibrillation

Lorenzo Bianchini, MD,<sup>a</sup> Marco Schiavone, MD,<sup>a,b</sup> Giulia Vettor, MD, PhD,<sup>a</sup> Alessio Gasperetti, MD, PhD,<sup>c</sup> Eleonora Penza, MD,<sup>d</sup> Andrea Ballotta, MD,<sup>e</sup> Sergio Pirola, MD,<sup>d</sup> Claudio Brambillasca, MD,<sup>e</sup> Elio Zito, MD,<sup>f</sup> Francesca De Lio, MD,<sup>g</sup> Nicoletta Ventrella, MD,<sup>f</sup> Fabrizio Tundo, MD, PhD,<sup>g</sup> Massimo Moltrasio, MD,<sup>h</sup> Gaetano Fassini, MD,<sup>h</sup> Gianluca Polvani, MD, PhD,<sup>d,h</sup> Claudio Tondo, MD, PhD<sup>a,h</sup>

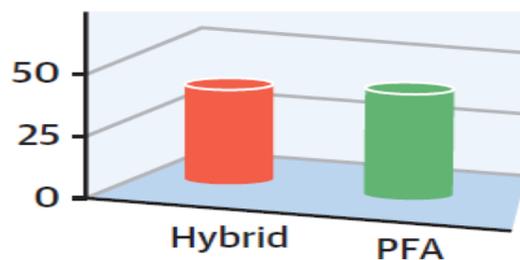
### CENTRAL ILLUSTRATION Hybrid-Convergent Procedure or Pulsed Field Ablation in Long-Standing Persistent Atrial Fibrillation

#### 93 Consecutive LSPAF Patients Undergoing AF Ablation (PVI + LAPWI)



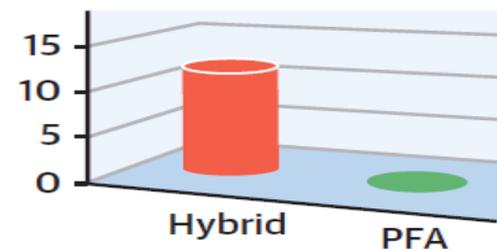
### Outcomes of Interest

**Efficacy outcome:** ATAs recurrence after the 3-month blanking-period over 12-month follow-up



log-rank at survival analysis  
 $P = 0.539$   
(y-values as percentage)

**Safety outcome:** Periprocedural adverse events and late complications during follow-up



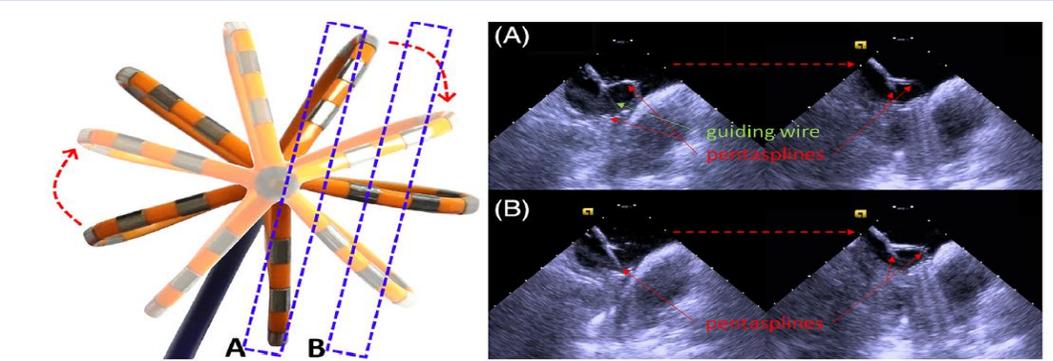
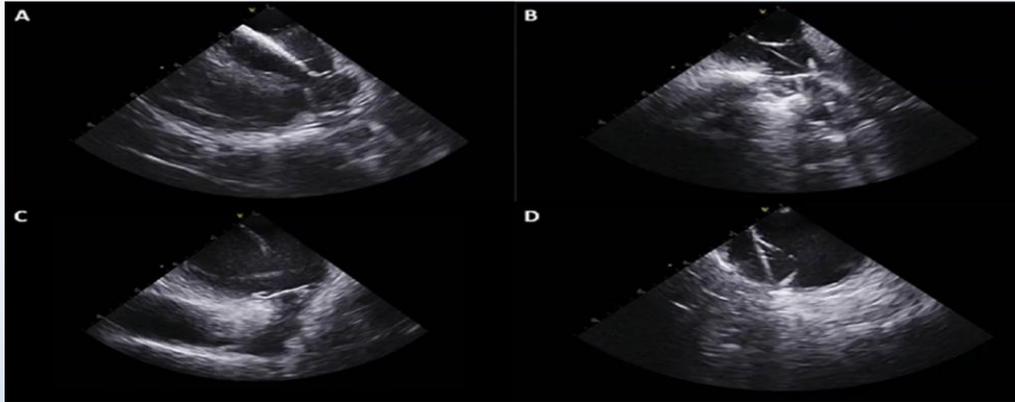
$P = 0.028$   
(y-values as percentage)

**Outcome predictors:** LA volume and recurrences during the blanking period were predictors of ATAs recurrences after ablation, regardless of procedural technique employed

# APPROCCIO ICE GUIDATO vs APPROCCIO FLUORO GUIDATO

**Intracardiac echocardiography-guided pulsed-field ablation for successful ablation of atrial fibrillation: a propensity-matched analysis from a large nationwide multicenter experience**

Antonio Dello Russo<sup>1,2</sup> · Claudio Tondo<sup>3</sup> · Vincenzo Schillaci<sup>4</sup> · Michela Casella<sup>1,5</sup> · Saverio Iacopino<sup>6</sup> · Stefano Bianchi<sup>7</sup> · Gaetano Fassini<sup>3</sup> · Antonio Rossillo<sup>8</sup> · Paolo Compagnucci<sup>1,2</sup> · Marco Schiavone<sup>3</sup> · Armando Salito<sup>4</sup> · Ruggero Maggio<sup>9</sup> · Laura Cipolletta<sup>1</sup> · Sakis Themistoclakis<sup>10</sup> · Claudio Pandozi<sup>11</sup> · Pasquale Filannino<sup>6</sup> · Pietro Rossi<sup>7</sup> · Carlo Bonanno<sup>8</sup> · Quintino Parisi<sup>1</sup> · Maurizio Malacrida<sup>12</sup> · Francesco Solimene<sup>2,4</sup>

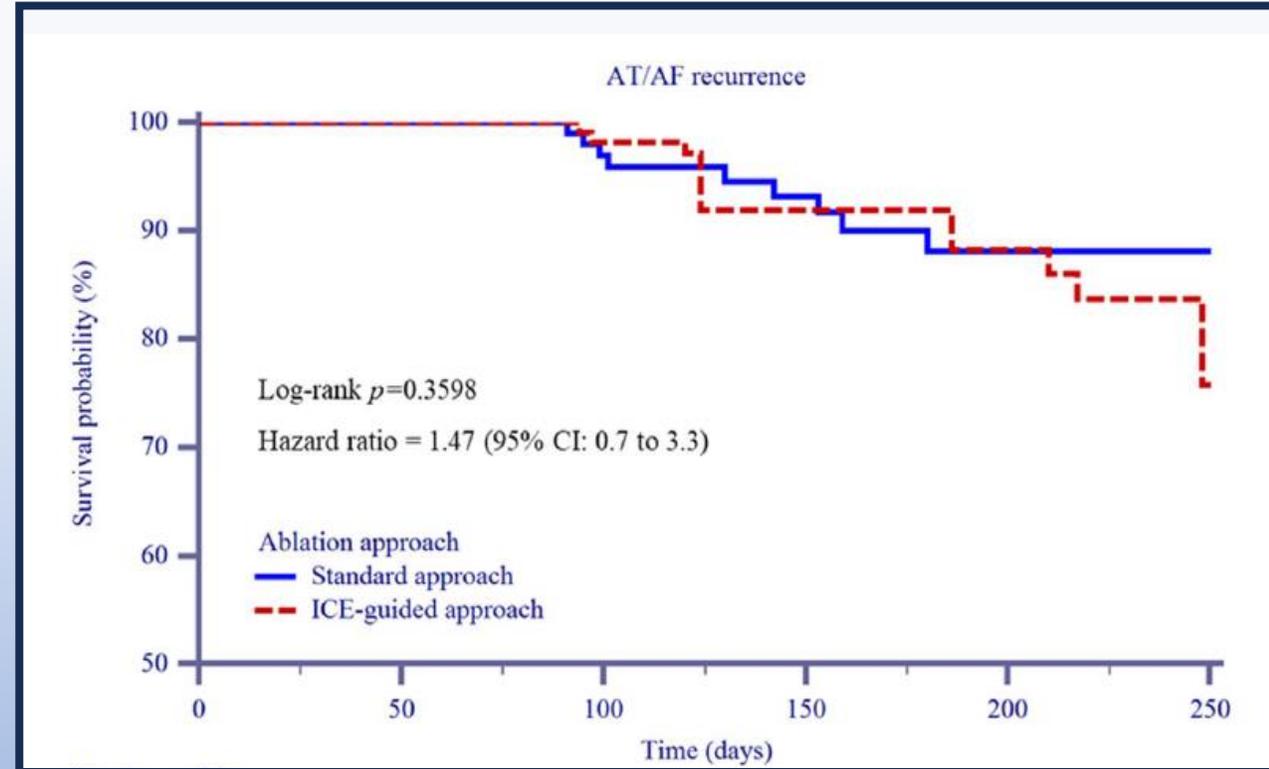


**556 PAZIENTI**

**PROPENSITY MATCHING**

**138 APPROCCIO ECO vs 138 SOLO FLUORO**

**NO ICE vs ICE**



**L'APPROCCIO FLUOROSCOPICO FORNISCE GLI STESSI OUTCOME DELL'APPROCCIO ICE**

# Role of 3D electro-anatomical mapping on procedural characteristics and outcomes in pulsed-field ablation for atrial fibrillation

Patrick Badertscher <sup>1,2,\*†</sup>, Teodor Serban <sup>1,2†</sup>, Corinne Isenegger<sup>1,2</sup>, Philipp Krisai <sup>1,2</sup>, Gian Voellmin <sup>1,2</sup>, Stefan Osswald <sup>1,2</sup>, Sven Knecht <sup>1,2</sup>, Christian Sticherling <sup>1,2</sup>, and Michael Kühne <sup>1,2</sup>

## Mapping vs NO Mapping



N = 197

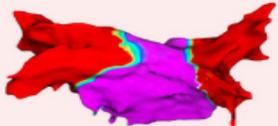
Patients with AF undergoing PFA PVI



Mapping



N = 127



Non-mapping



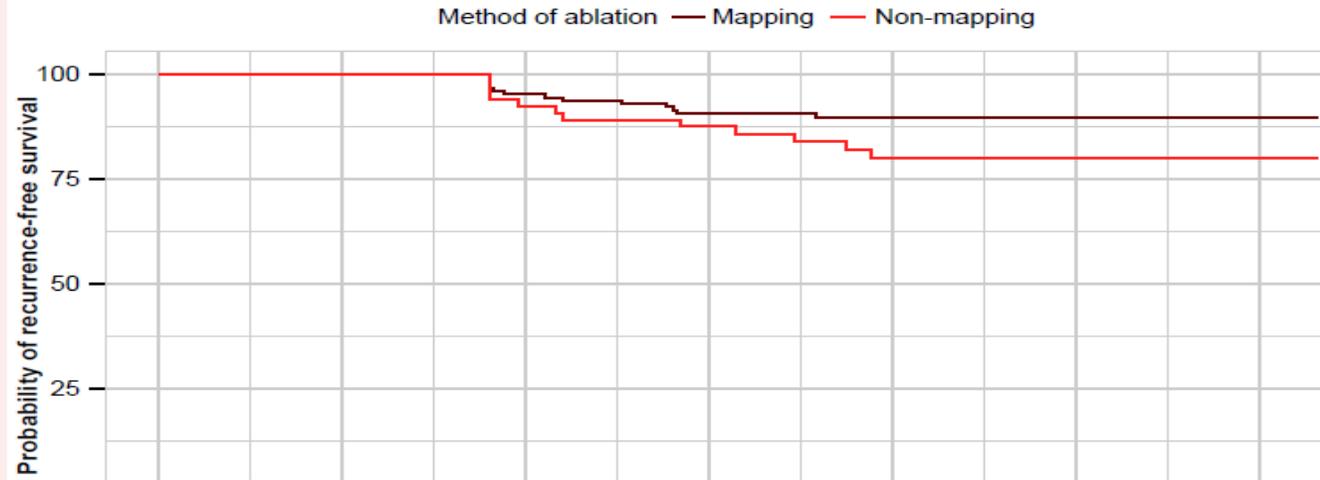
N = 70



Median follow-up:

267 (164–419) days

Recurrence-free survival after 1 year

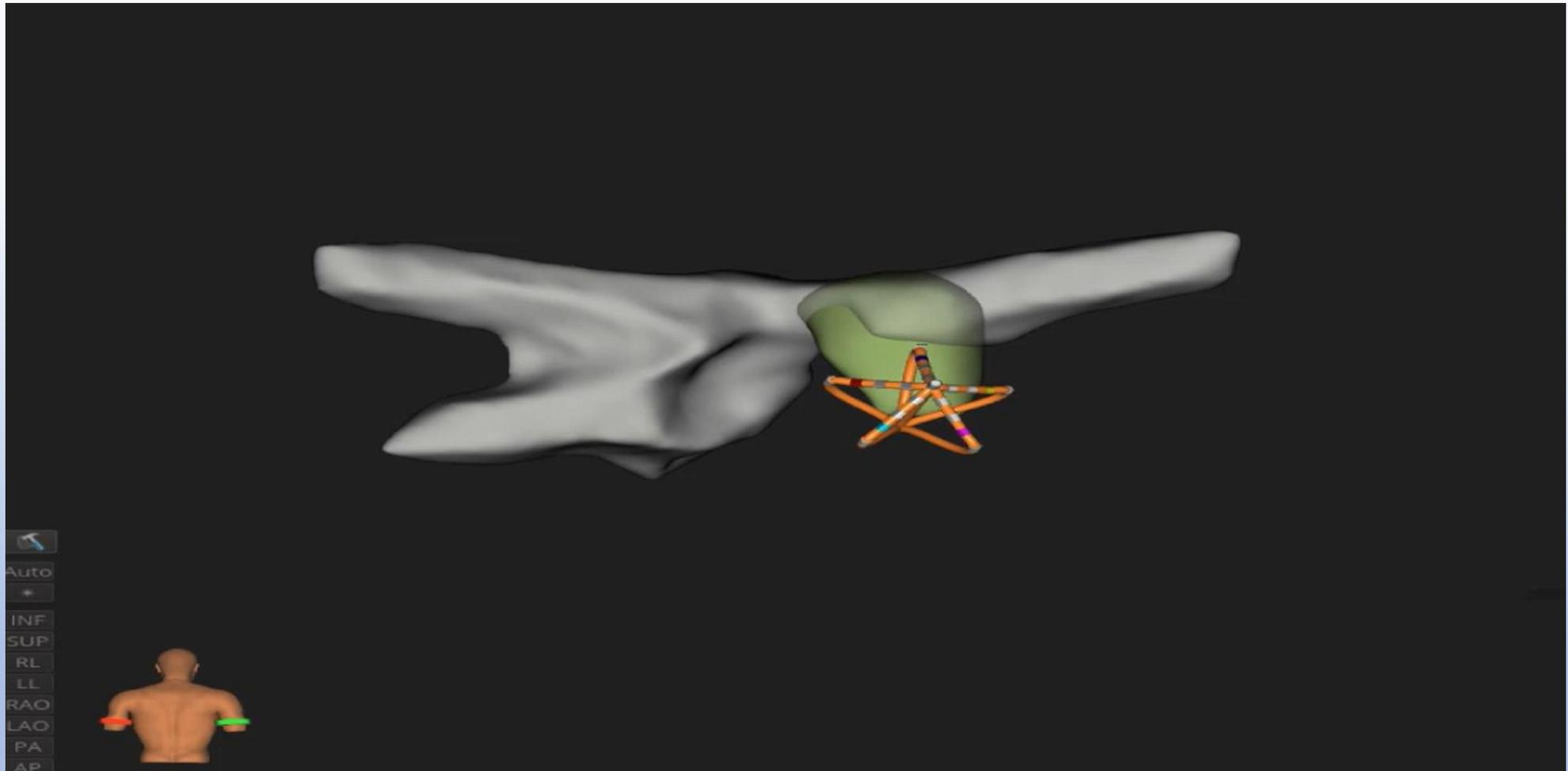


**Fluoro time significantly less in non mapping**

	Mapping	Non-mapping
Total procedure duration, min	55 (45–67)	28 (23–35)
LA dwell time, min	38 (30–49)	15 (11–21)
Recurrence	18 (14%)	12 (17%)
Redo-procedures	9 (7%)	6 (9%)
Reconnected PVs	6/9 (67%)	4/6 (67%)

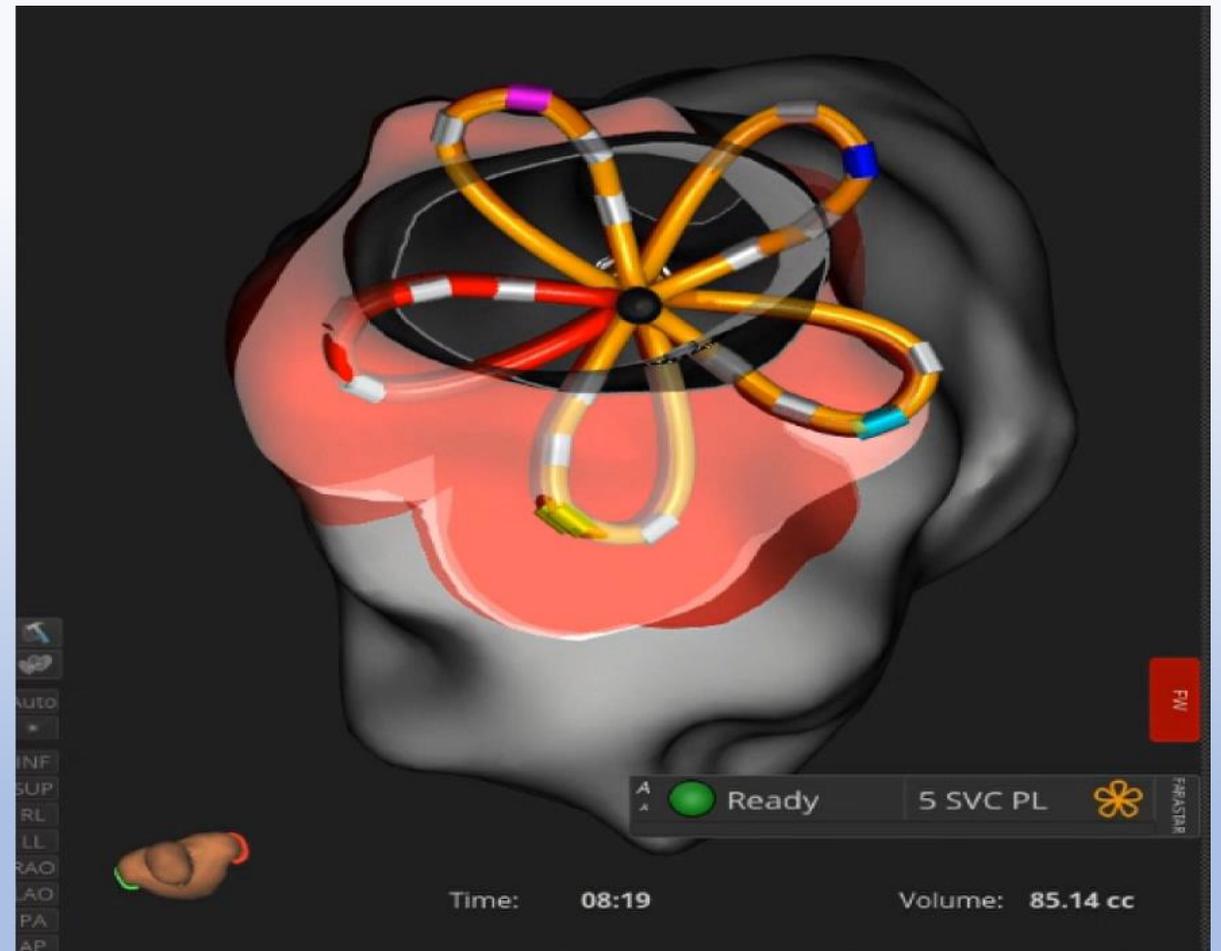
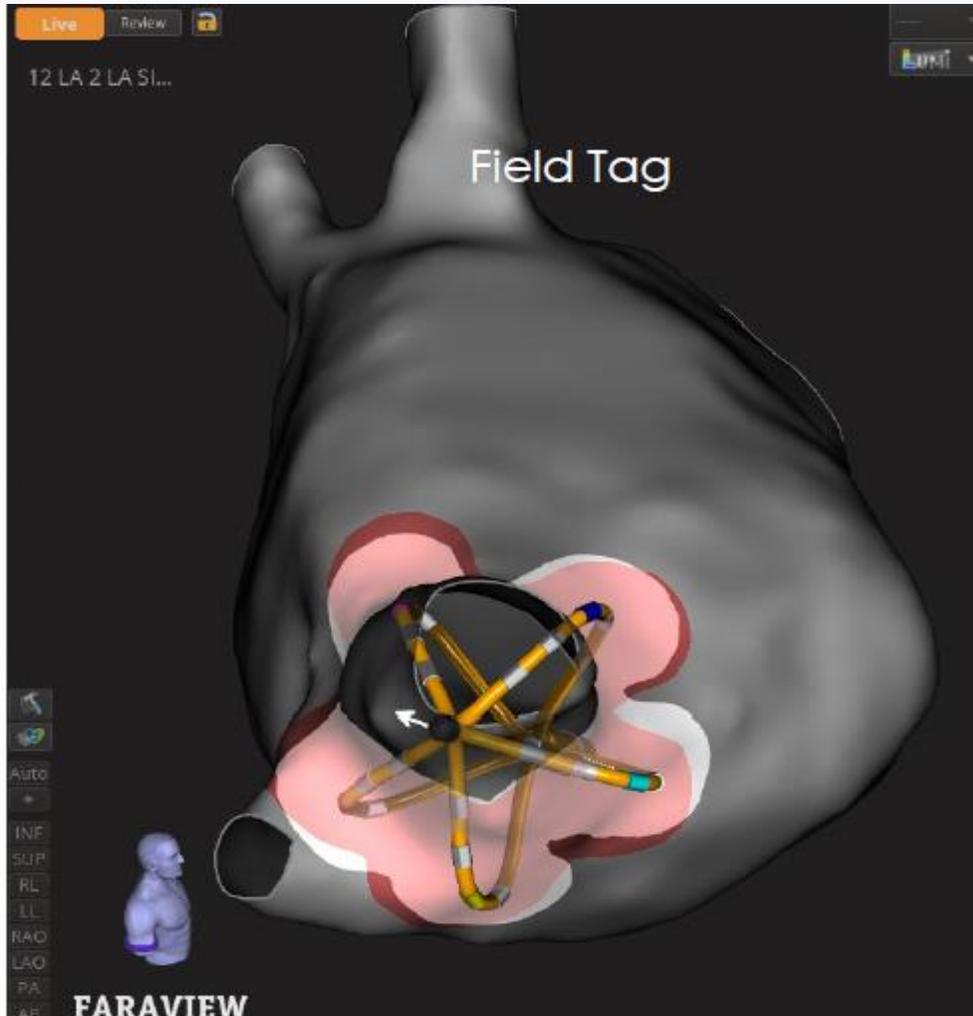
# GENERAZIONE DELL'ANATOMIA CON IL CATETERE FARAWAVE

*Esempio di ricostruzione anatomica*



# VISUALIZZAZIONE DELLA LESIONE

*Esempio di proiezione e rilascio dei tag di lesione*



# EVIDENZE DALLA PRATICA CLINICA

*Efficacia*

*Efficienza*

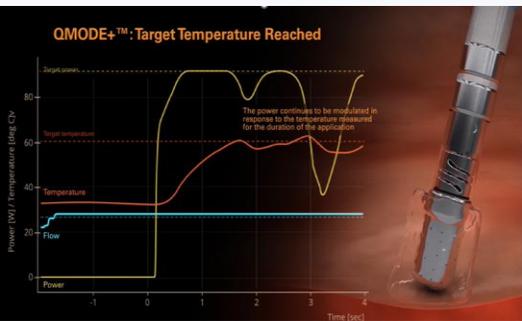
*Lezioni  
dalla pratica  
clinica*

*Riproducibilità*

*Sicurezza*

# TEMPI PROCEDURALI NEGLI STUDI SUL FARAPULSE

STUDY	PROCEDURAL TIME	FLUOROSCOPIC TIME
ADVENT	MEAN <u>105 MINUTES</u>	MEAN <u>21 MINUTES</u>
MANIFEST PF	MEAN <u>61 MINUTES</u>	MEAN <u>13.7 MINUTES</u>
EU-PORIA	MEDIAN W/EAM <u>45 MINUTES</u>	MEAN <u>14 MINUTES</u>
5S FRANKFURT	MEAN <u>38 MINUTES</u>	MEAN <u>8 MINUTES</u>
FAST AND FOURIUS	MEAN <u>27.4 MINUTES</u>	MEAN <u>6 MINUTES</u>



# 90 W/4s vs FARAPULSE



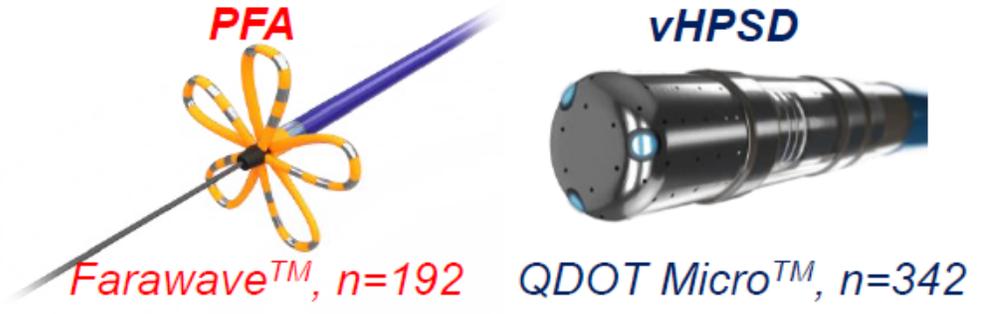
**Pulsed Field versus Very-High Power Short Duration Radiofrequency Ablation for Atrial Fibrillation: Results of a Multicenter, Real-World Experience**

Antonio Dello Russo, MD, PhD<sup>1,2\*</sup>; Paolo Compagnucci, MD, PhD<sup>1\*</sup>; Matteo Anselmino, MD, PhD<sup>3,4</sup>; Vincenzo Schillaci, MD<sup>5</sup>; Francesca Campanelli, MD<sup>1,2</sup>; Maria Rosaria Ascione, MD<sup>4,5</sup>; Giovanni Volpato, MD<sup>1,2</sup>; Laura Cipolletta, MD, PhD<sup>1</sup>; Quintino Parisi, MD, PhD<sup>1</sup>; Yari Valeri, MD<sup>1,2</sup>; Leonardo D'Angelo, MD<sup>1,2</sup>; Paola Chiariello, MD<sup>6</sup>; Michela Casella, MD, PhD, FEHRA<sup>1,7</sup>; Francesco Solimene, MD<sup>2,5</sup>



**534 patients (63±9 years; 36% female; 83% undergoing a first procedure) undergoing catheter ablation for paroxysmal or persistent AF**

- 3 high-volume electrophysiology centers in Italy
- Years 2020-2023



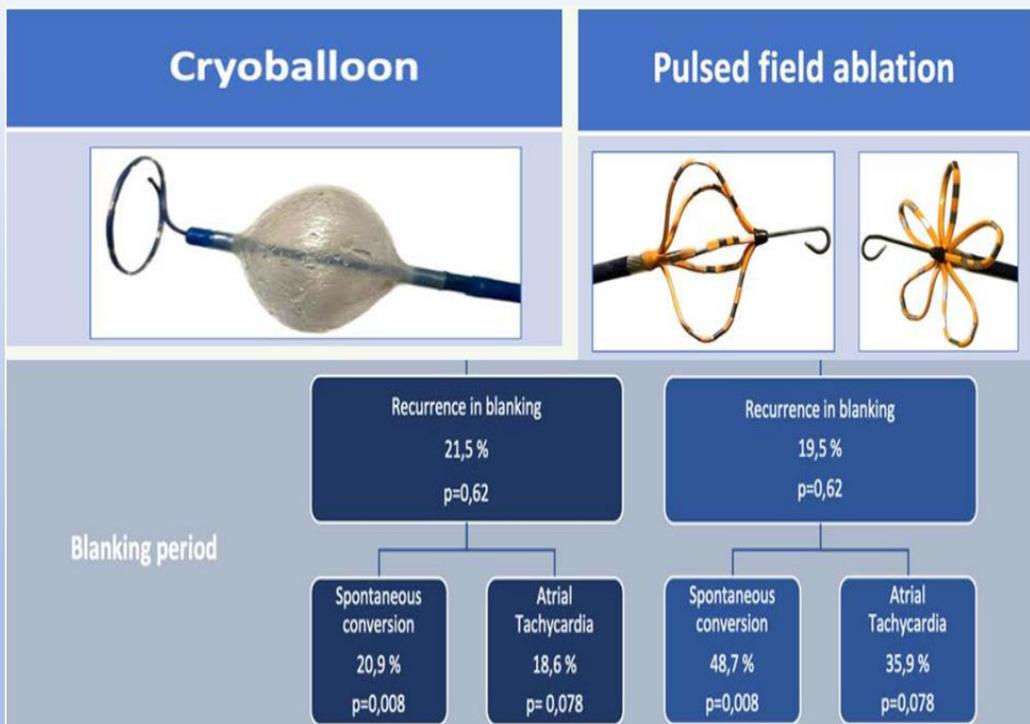
**Procedural data, safety, and efficacy over a follow-up of 12 (9-12) months**

# CRIOABLAZIONE vs FARAPULSE

## Pulsed Field Versus Cryoballoon Pulmonary Vein Isolation for Atrial Fibrillation: Efficacy, Safety, and Long-Term Follow-Up in a 400-Patient Cohort

Lukas Urbanek MD\*, Stefano Bordignon MD\*, David Schaack MD, Shaojie Chen MD, Shota Tohoku MD, Tolga Han Efe MD, Ramin Ebrahimi MD, Francesco Pansera MD, Jun Hirokami MD, Karin Plank MD, Alexander Koch MD, Britta Schulte-Hahn MD, Boris Schmidt MD, K.R. Julian Chun MD

### Balanced Cohorts



**Table 2. Procedural Data**

Procedural data	CB (n=200)	PFA (n=200)	P value
Procedural time, min	50 (45–60)	34.5 (29–40)	<0.001
Fluoroscopy time, min	6.9 (5.5–8.8)	7.1 (5.5–8.9)	0.958
Fluoroscopy dose, uGym <sup>2</sup>	491 (292–874)	414.5 (263–712)	0.058
PVs identified	783	787	
PVs acutely isolated with CB/PFA	779/783 (99.5%)	787/787 (100%)	0.062
CTI ablation	3/200 (1.5%)	3/200 (1.5%)	

**Table 3. Procedural Complications**

Procedural complications	CB (n=200)	PFA (n=200)	P value
Complications at access site	7 (3.5%)	5 (2.5%)	0.558
Persistent PNP	3 (1.5%)	0	0.248
Tamponade	0	1 (0.5%)	
Stroke or TIA	1 (0.5%)	0	
Esophageal injury	1 (0.5%)	0	
Hemoptysis	1 (0.5%)	0	
Total	13 (6.5%)	6 (3.0%)	0.1

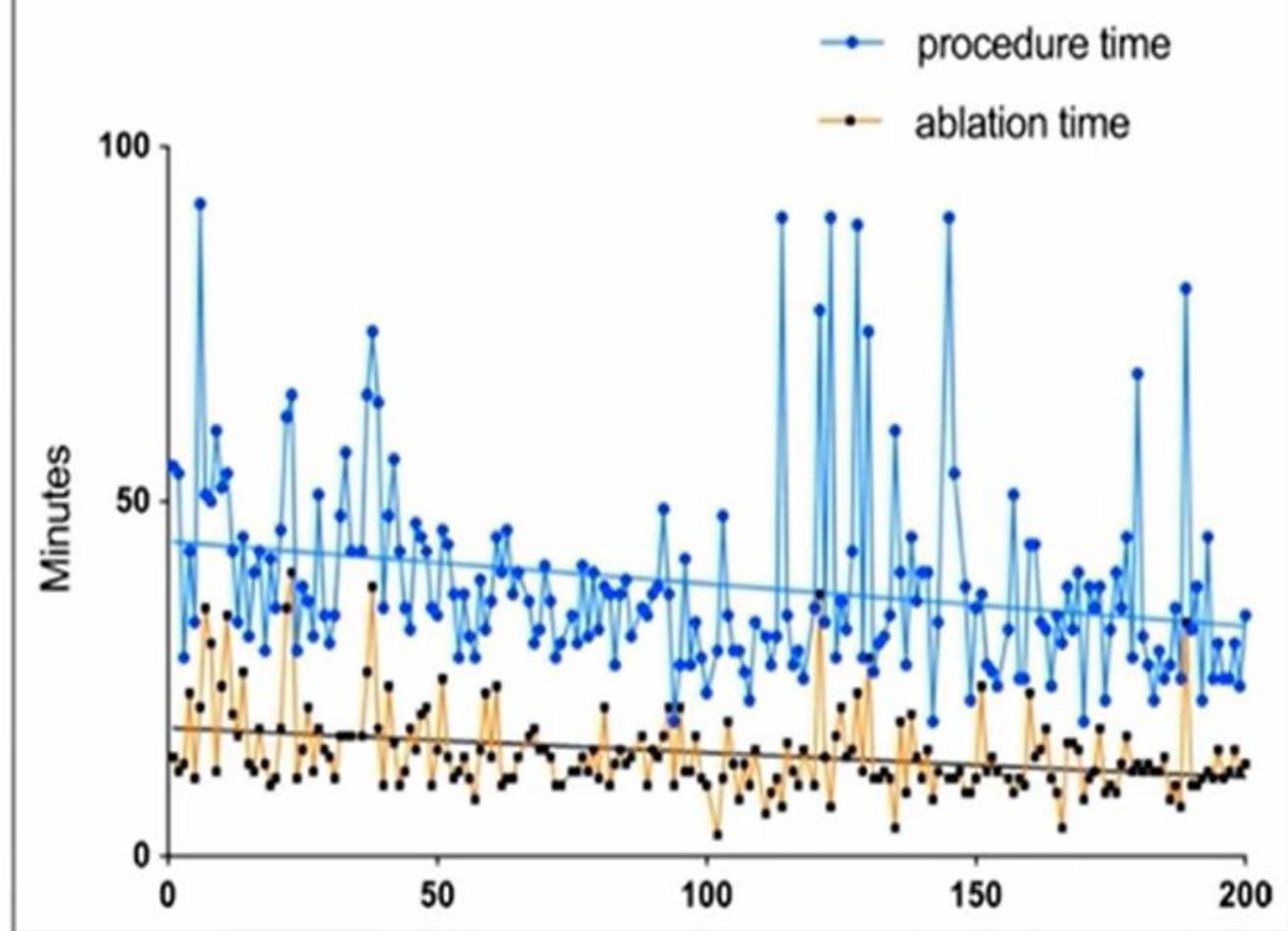
# IMPATTO SULLA PRATICA CLINICA: CURVA DI APPRENDIMENTO

## 5S Study: Safe and Simple Single Shot Pulmonary Vein Isolation With Pulsed Field Ablation Using Sedation

Boris Schmidt, MD; Stefano Bordignon, MD; Shota Tohoku, MD; Shaojie Chen, MD; Fabrizio Bologna, MD; Lukas Urbanek, MD; Francesco Panseca, MD; Matthias Ernst, MD; K.R. Julian Chun, MD

Procedural characteristics, n	Phase 1	Phase 2	P value
	25 Pts, 98 PV	166 Pts, 650 PVs	
Duration of overall procedure, mins			
Mean±SD, n	46±14	38±14	0.004*
Median (min-max)	43 (28-92)	35 (19-90)	
Overall fluoroscopy time, mins			
Mean±SD, n	11±5	8±4	0.001*
Median (min-max)	9.9 (5.1-22.9)	7.5 (3.9-27.9)	
Number of catheters used			
1, n (%)	24 (96%)	166 (100%)	
2, n (%)	1 (4%)	0 (0%)	
Catheter size (31/35 mm), n (%)	14/11 (56%/44%)	82/84 (49%/51%)	
Number of veins attempted, n	98	650	...
Number of applications, per vein	8±1	8±0	
Single-shot isolation, n (%)	95 (97%)	649 (100%)	0.007†
Patients with all PVs single-shot isolation, n (%)	22 (88%)	165 (99%)	0.006†

## Learning curve of PFA Ablation



# RIPRODUCIBILITÀ

Gli outcome della procedura sono identici per utilizzatori Crio ed RF



7 European centers

42 operators

1233 AF patients treated with PFA



## Acute efficacy

99.96% PVI  
58 min procedure time

## Acute safety

1.7% major complications  
(1.1% pericardial tamponade,  
0.41% stroke, 0.16% TIA)

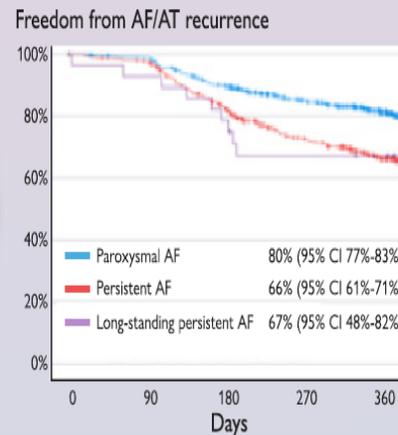
## Chronic efficacy

AF/AT-free survival at  
365 days median follow up

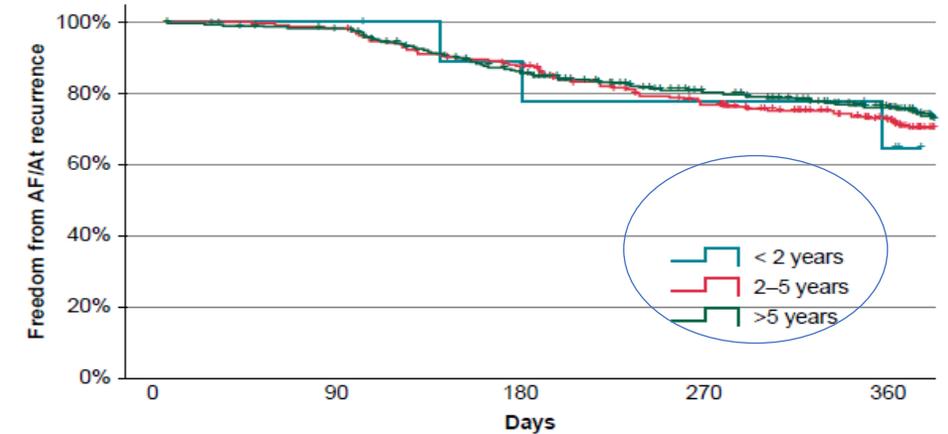
80% in paroxysmal AF  
66% in persistent AF

Reproducible results among centers irrespective of operator experience

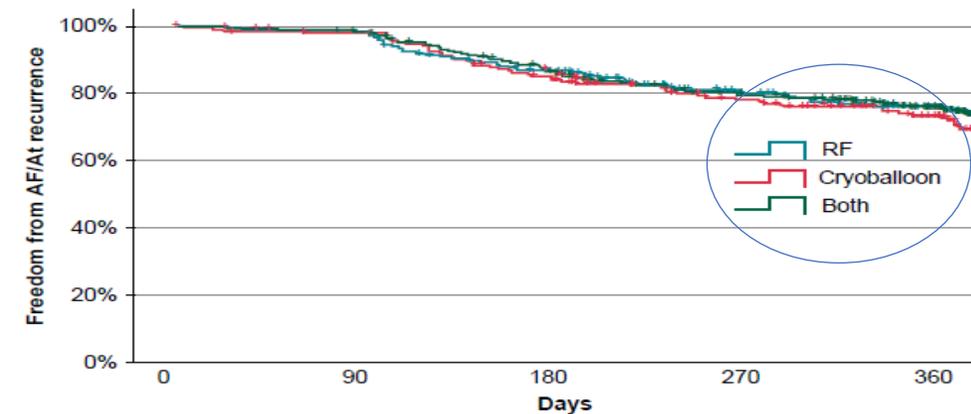
## Freedom from AF/AT recurrence by AF indication (PFA index procedures)



## A Freedom from AF/AT recurrence by operator experience



## B Freedom from AF/AT recurrence by primary ablation modality



# EVIDENZE DALLA PRATICA CLINICA

*Efficacia*

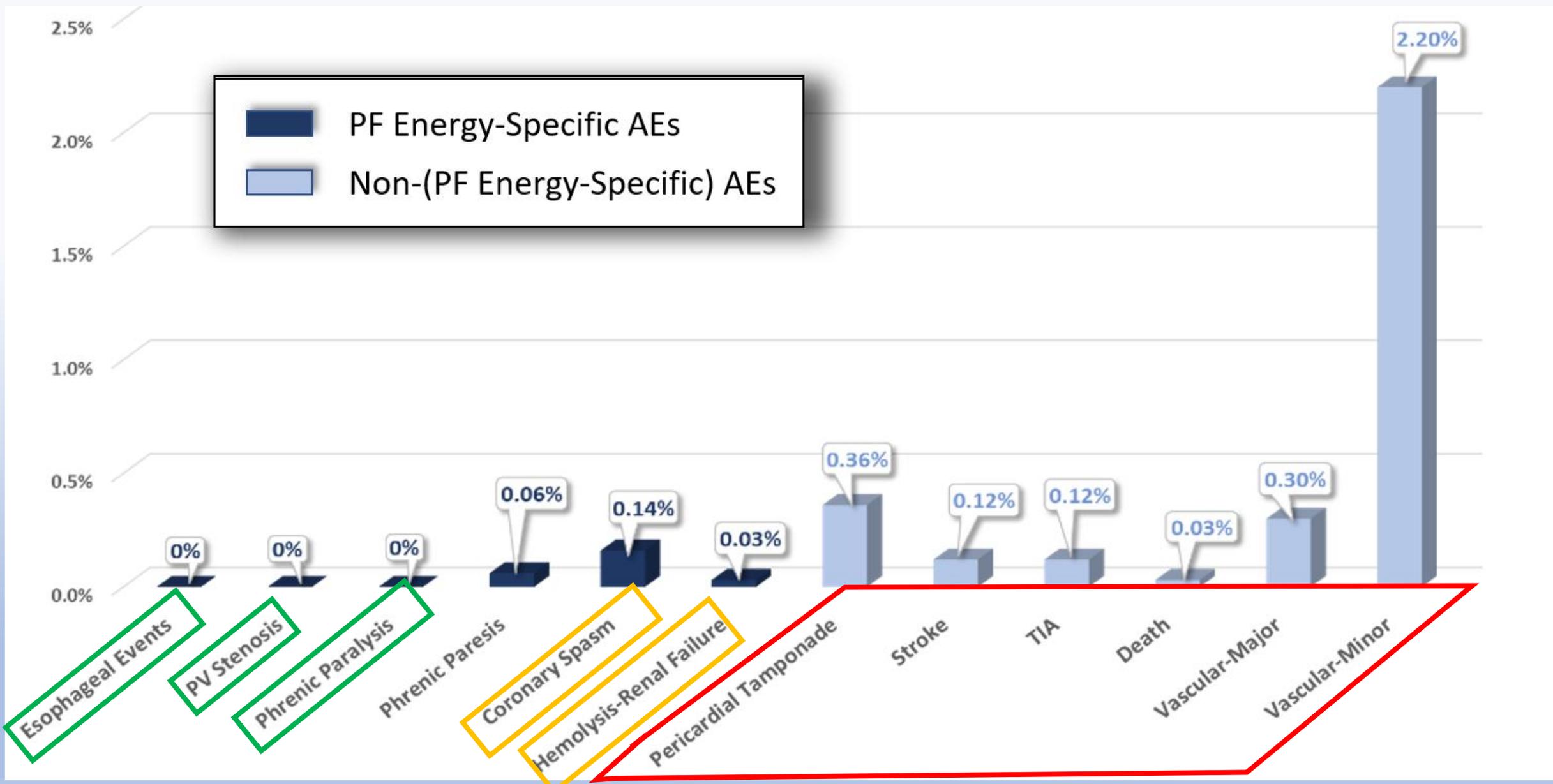
*Efficienza*

*Lezioni  
dalla pratica  
clinica*

*Riproducibilità*

*Sicurezza*

# PERCHE' PVI NEI PERSISTENTI CON FARAPULSE: SICUREZZA



**GRAZIE PER L'ATTENZIONE**