



CONGRESSO

ROMA, 25 - 27 Giugno 2026

SEDE DEI LAVORI

A. Roma Lifestyle Hotel
Via Giorgio Zoega 59, Roma

30 anni di ABLAZIONE della FA

“ Bisogna conoscere il passato
per comprendere il presente

e

orientare il futuro.”

(κτῆμα ἐς αἰεί) Tucidide, V sec. A.C.

Prof. Fiorenzo Gaita

*Department of Medical Sciences, University of
Turin,*

J Medical TO & IRCCS S. Donato MI



Disclosures: none

Keep in mind the
Aims of AF management

Symptoms relief and ↑ exercise tolerance

**Reduction hospitalizations and morbidity
(not only stroke)**

Reduction of mortality

AAD
(Rhythm control)

vs.

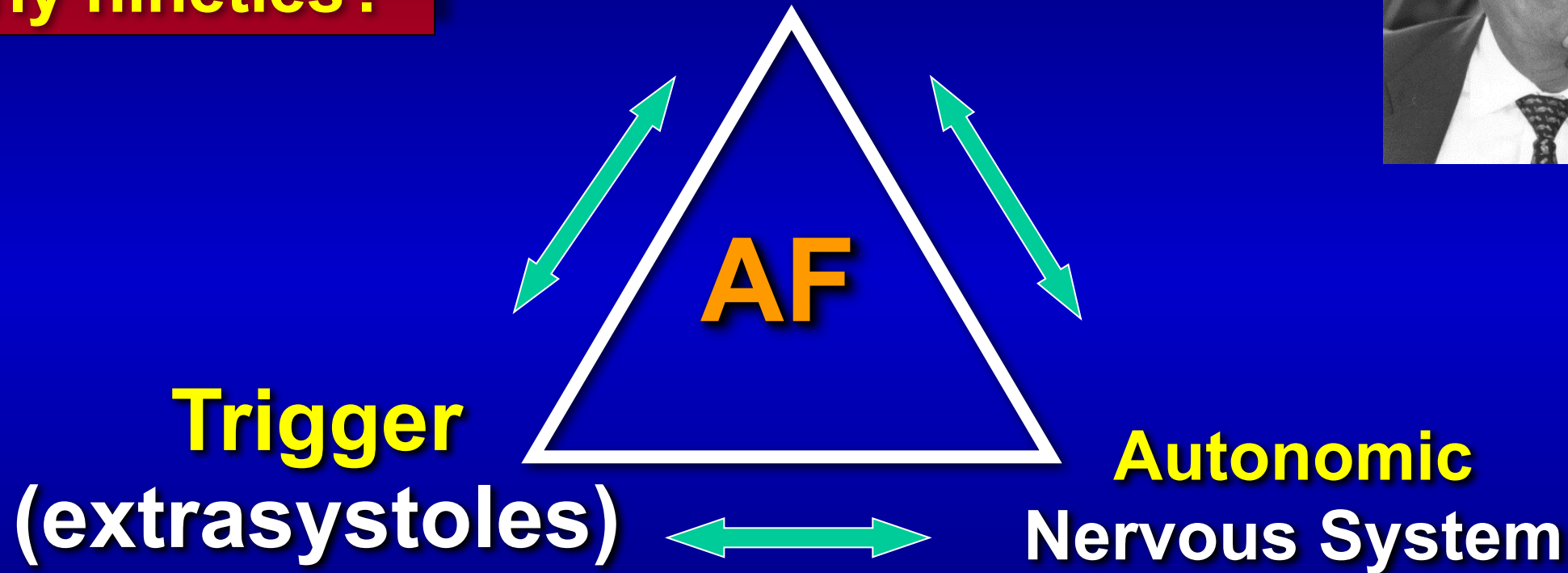
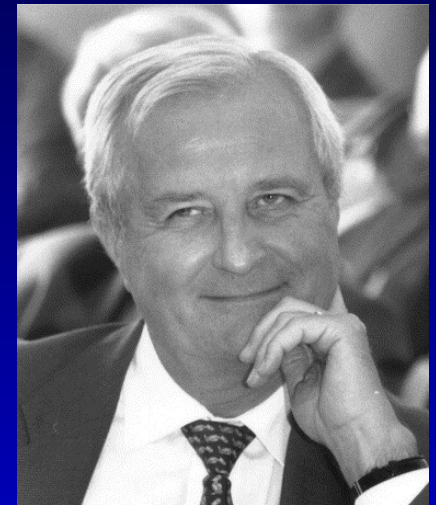
Beta-blocker
(Rate control)

Trial	Inclusion criteria	Primary outcome Parameter	Patients reaching primary outcome (n)		
			Rate ctrl	Rhythm ctrl	P
PIAF (2000) 252 Patients	Persistent AF (7-360 days)	Symptomatic improvement	76/125 (60.8%)	70/127 (55.1%)	0.32
AFFIRM (2002) 4060 Patients	Paroxysmal AF or persistent AF, age ≥65 years, or risk of stroke or death	All-cause mortality	310/2027 (25.9%)	356/2033 (26.7%)	0.08
RACE (2002) 522 Patients	Persistent AF or flutter for <1 year and 1-2 cardioversions over 2 years and oral anticoagulation	Composite: cardiovascular death, CHF, severe bleeding, pacemaker implantation, thrombo-embolic events,	44/256 (17.2%)	60/266 (22.6%)	0.11

**Pharmacological antiarrhythmic therapy
improves QoL, reduces hospitalizations
but does not affect survival**

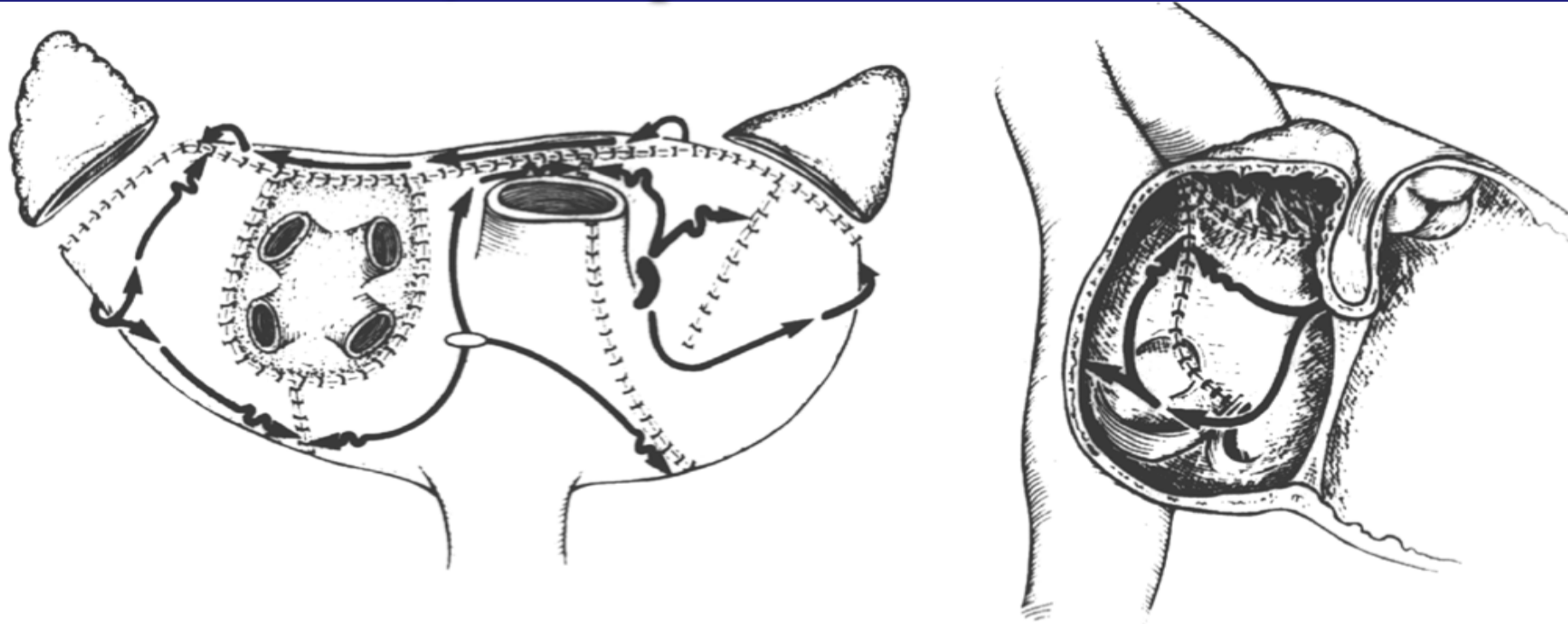
**What was our
knowledge in the
early nineties?**

**Substrate
(Critical mass)**



Who started and when ?

J. Cox, Maze procedure 1996



178 pts (103 paroxysmal, 75 chronic)

Follow-up : 3 - 102 months

Success rate: **93%**

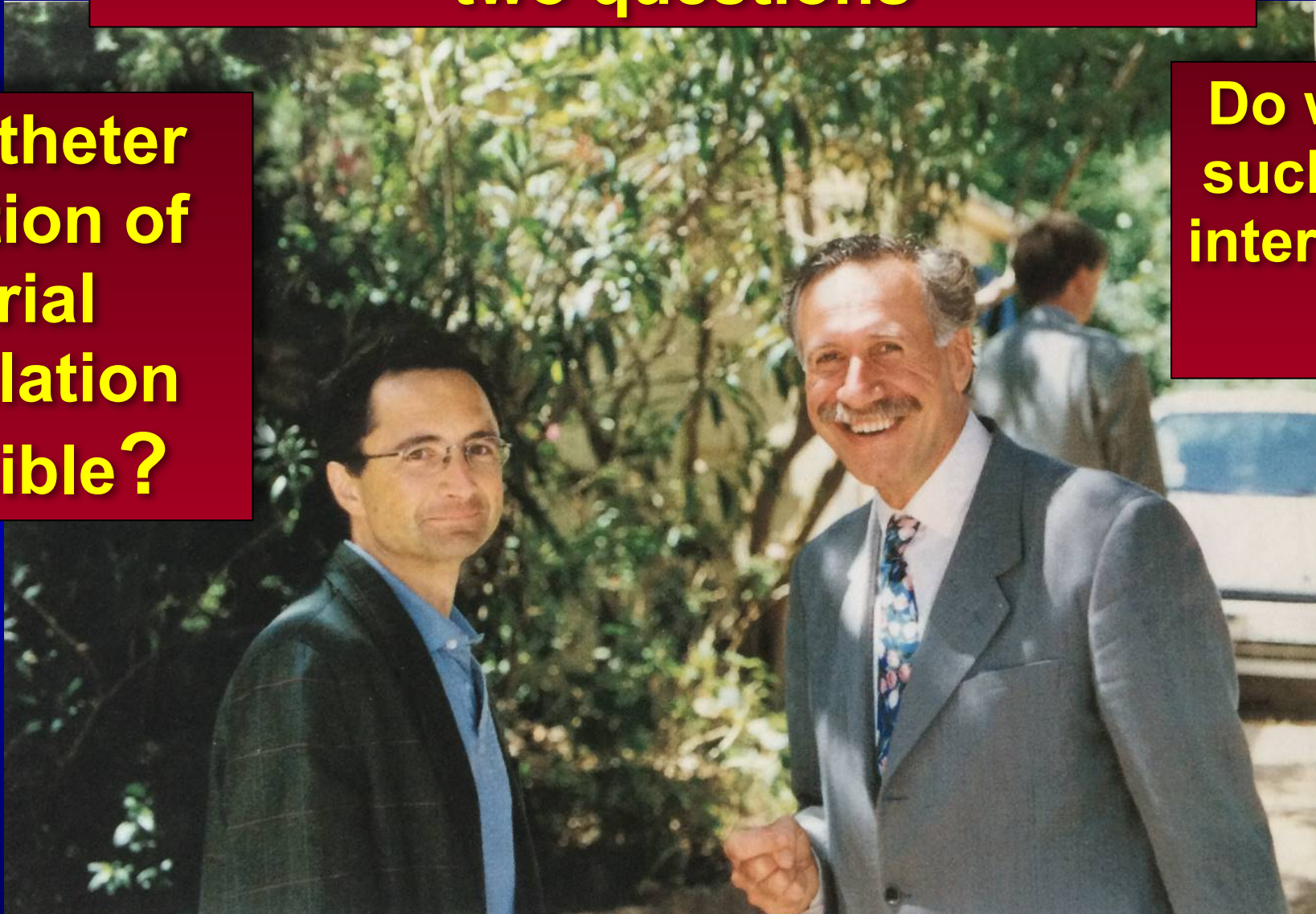
Complications: PM implant 30 pts, 1 stroke, 2 MI
4 deaths

Substrate
modification:
linear lesions



**in 1996 we asked ourselves
two questions**

**Is catheter
ablation of
atrial
fibrillation
feasible?**



**Do we really need
such an extensive
intervention (Maze)
?**

Inappropriate tools and technologies:

**char formation with 1-mm tip catheter
and absence of temperature control**



Courtesy of prof. Breithard and Prof. Borggreffe

Heterogeneous Substrate of AF

WPW SSS

adrenergic idiopathic vagal

HF CMP valvular

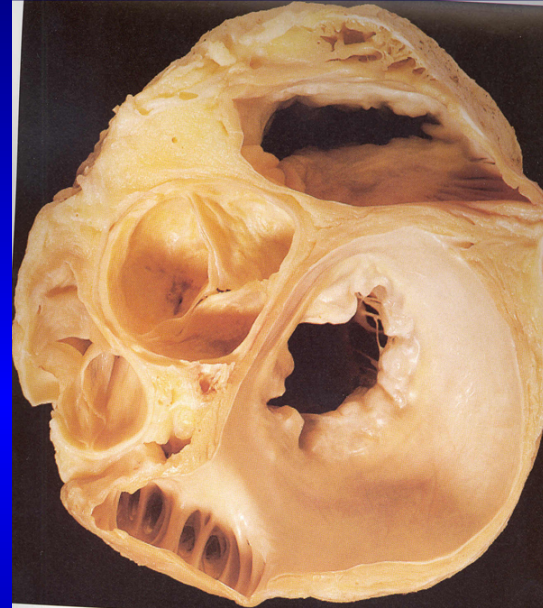
hypertensive
heart disease

Channelopathies

Brugada

Short QT

Normal Atrium



Courtesy of Anton Becker

enlarged left atrium



Mitral Stenosis

The ~~et~~ ~~ion~~

The Atrial
FibrillationS

Atrial Fibrillation Transcatheter ablation

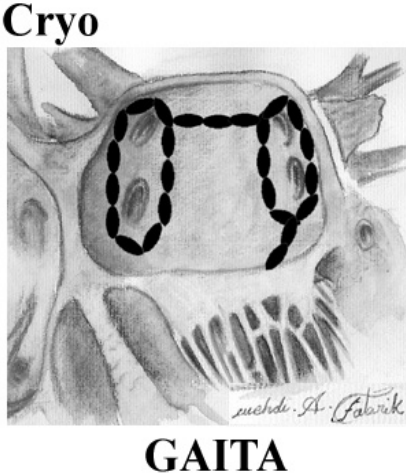
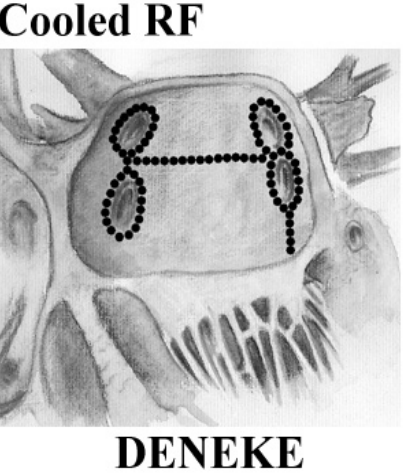
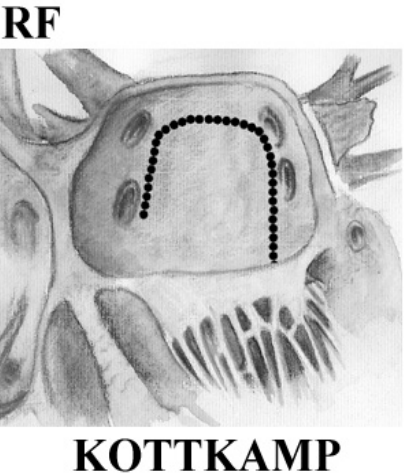
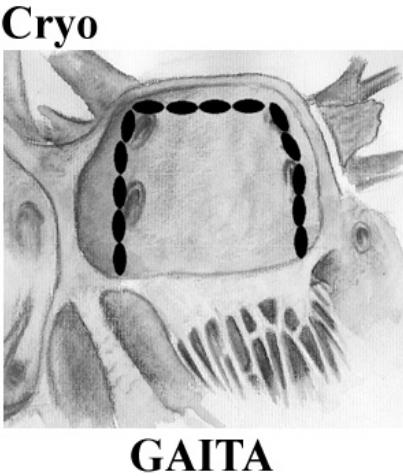
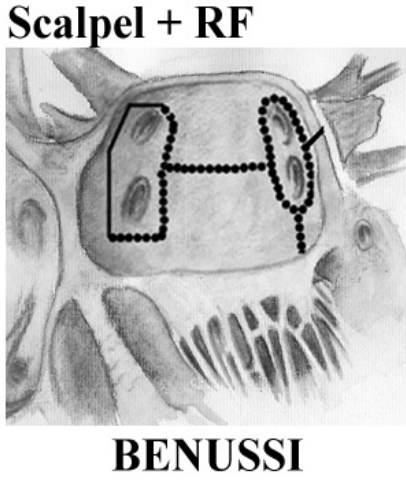
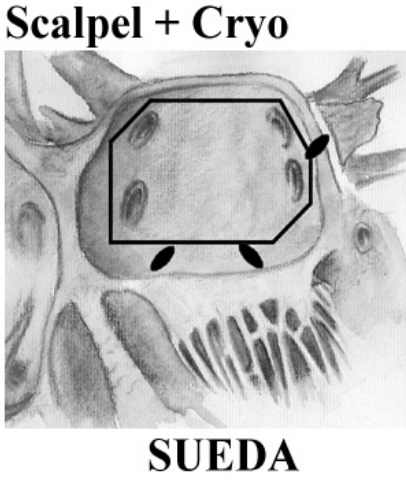
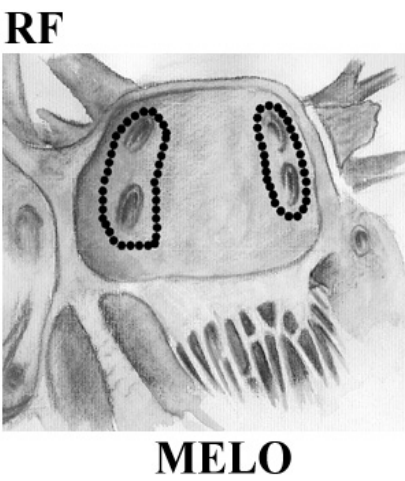
1996

Bordeaux

Asti



enlarged left atrium



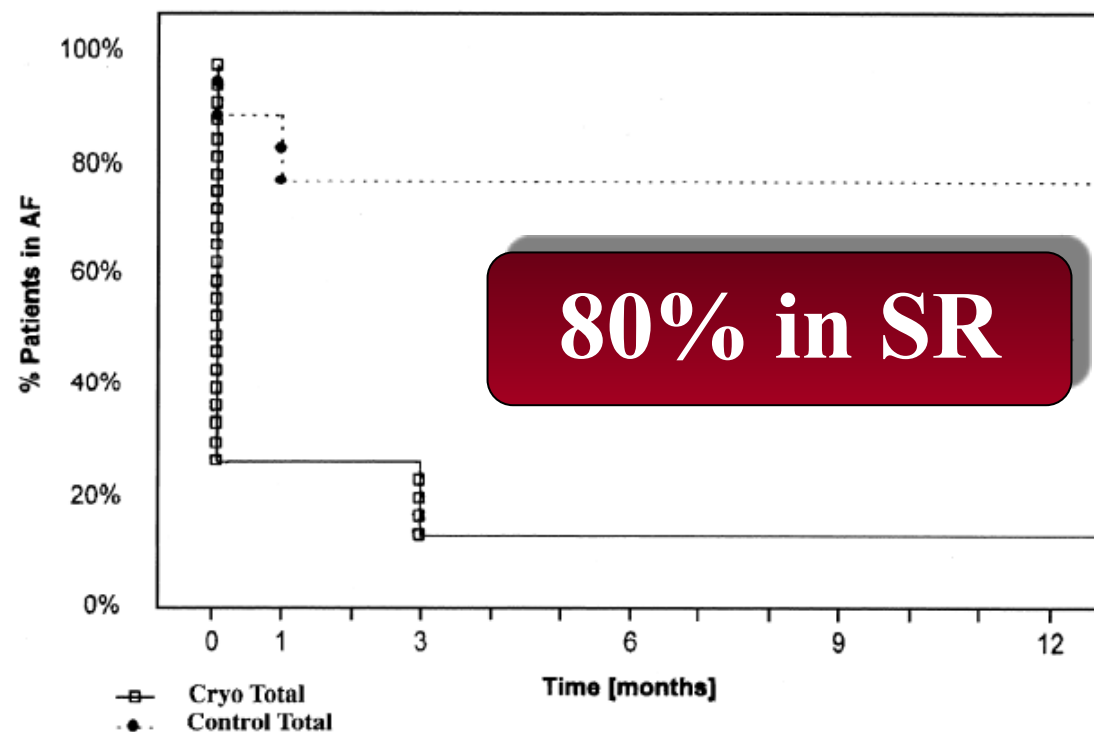
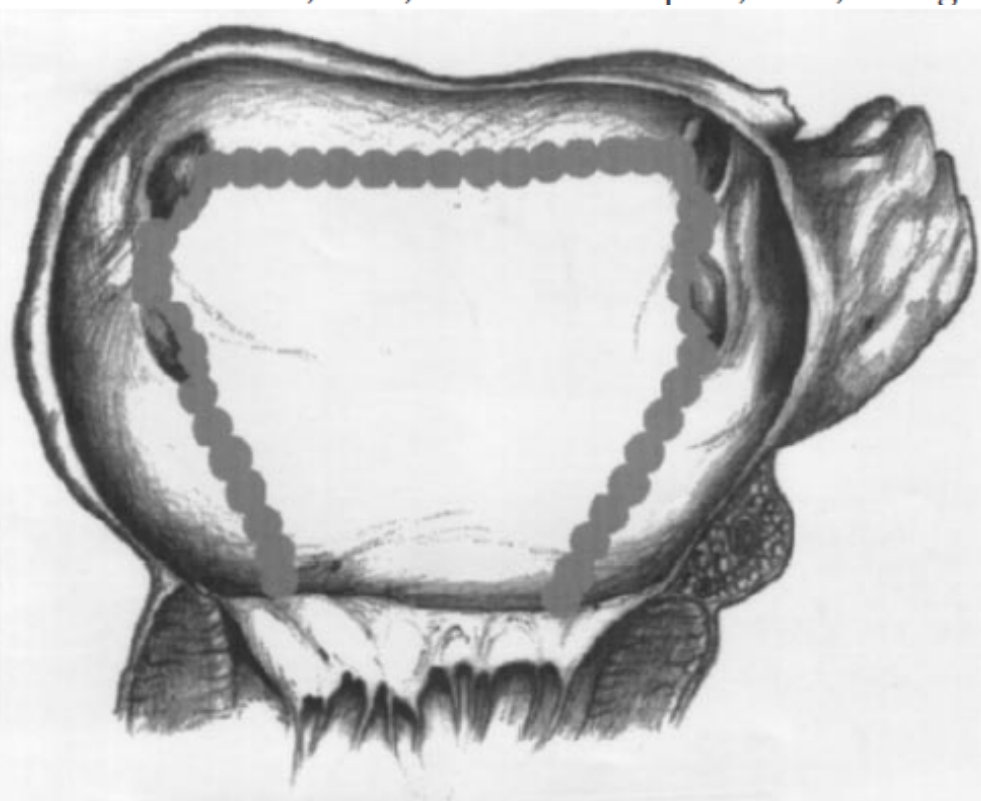
- RF
- Cryo
- Scalpel

Different schemes and different sources of energy
for surgical AF Ablation proposed 1996 /2000

MAZE:
Do we really
need such an
extensive
intervention?

Limited Posterior Left Atrial Cryoablation in Patients With Chronic Atrial Fibrillation Undergoing Valvular Heart Surgery

Fiorenzo Gaita, MD,* Roberto Gallotti, MD,* Leonardo Calò, MD, Eric Manasse, MD,*
Riccardo Riccardi, MD, Lucia Garberoglio, MD, Francesco Nicolini, MD,* Marco Scaglione, MD,
Paolo Di Donna, MD, Domenico Caponi, MD, Giorgio Franciosi, MD*



Atrial Mapping and Radiofrequency Catheter Ablation in Patients With Idiopathic Atrial Fibrillation

Electrophysiological Findings and Ablation Results

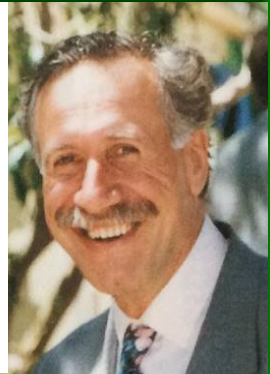
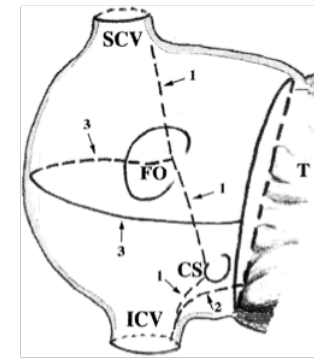
Fiorenzo Gaita, MD; Riccardo Riccardi, MD; Leonardo Calò, MD; Marco Scaglione, MD;
Lucia Garberoglio, MD; Renzo Antolini, PhD; Michele Kirchner, PhD;
Filippo Lamberti, MD; Elena Richiardi, MD

American Heart Association
Learn and Live...

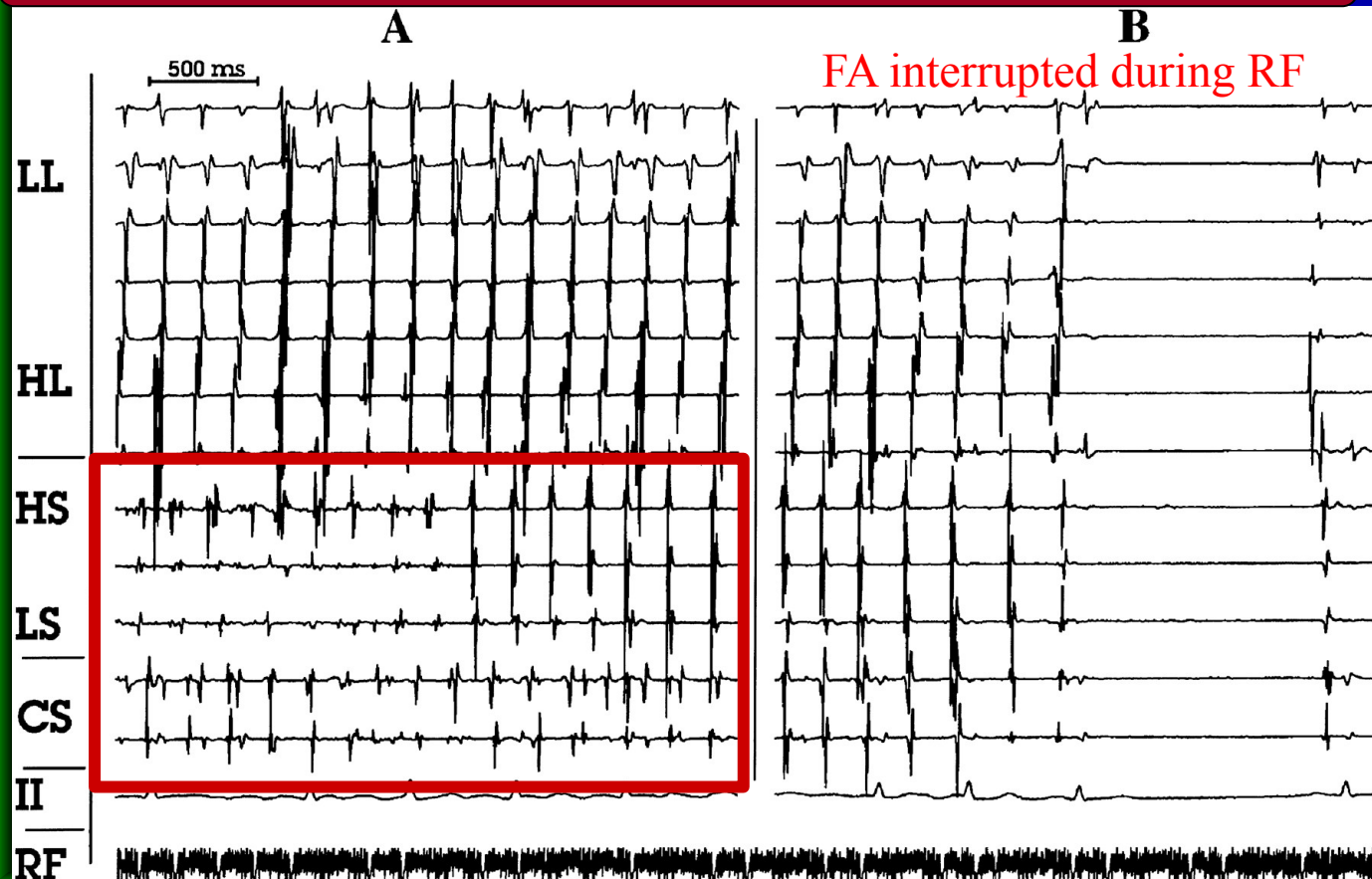
Circulation

JOURNAL OF THE AMERICAN HEART ASSOCIATION

1998;97:2136-2145



16 pts with Vagal idiopathic AF



ablation in the right anatomical areas with
low and **fragmented**
atrial potentials
(ganglionated Plexi location)

Predictor of success was
reduction of
vagal tone

demonstrated by the increase in heart rate
and the reduction of heart rate variability

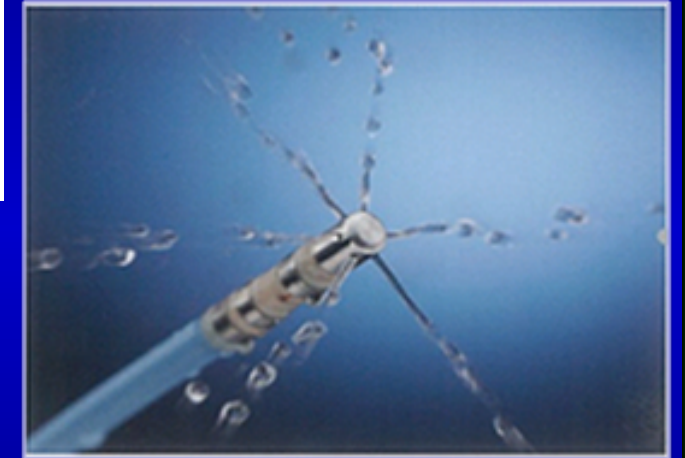
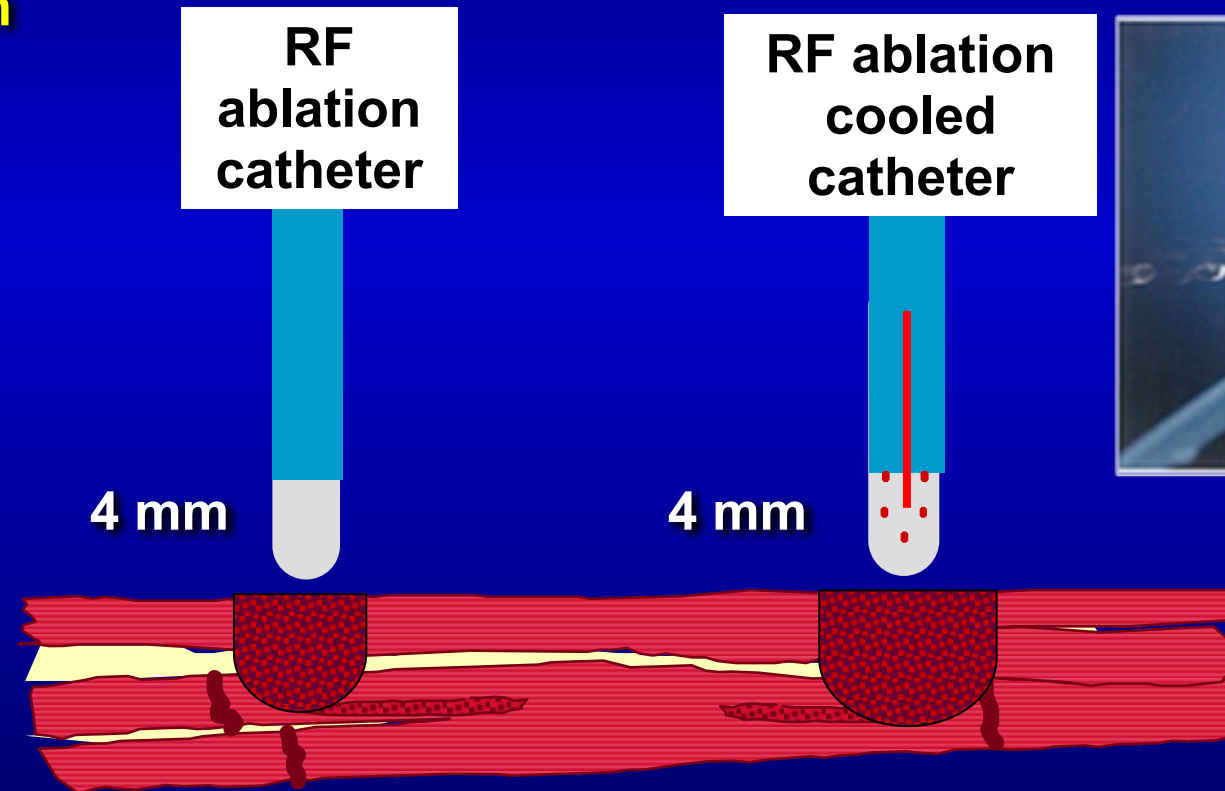
Follow-up (years)	1	3
Success	56%	28%
Complications	none	none

“The Olds Tools”

Inappropriate tools and technologies:
char formation with 1-mm tip catheter
and absence of temperature control

“The Right Tools” for left atrial ablation

4 mm irrigated/cooled catheter produces larger and safer lesions, decreasing the risk of cerebral vascular accidents



PV ablation as anatomical target

Interest moves from *substrate* to *triggers*

Trigger



Substrate

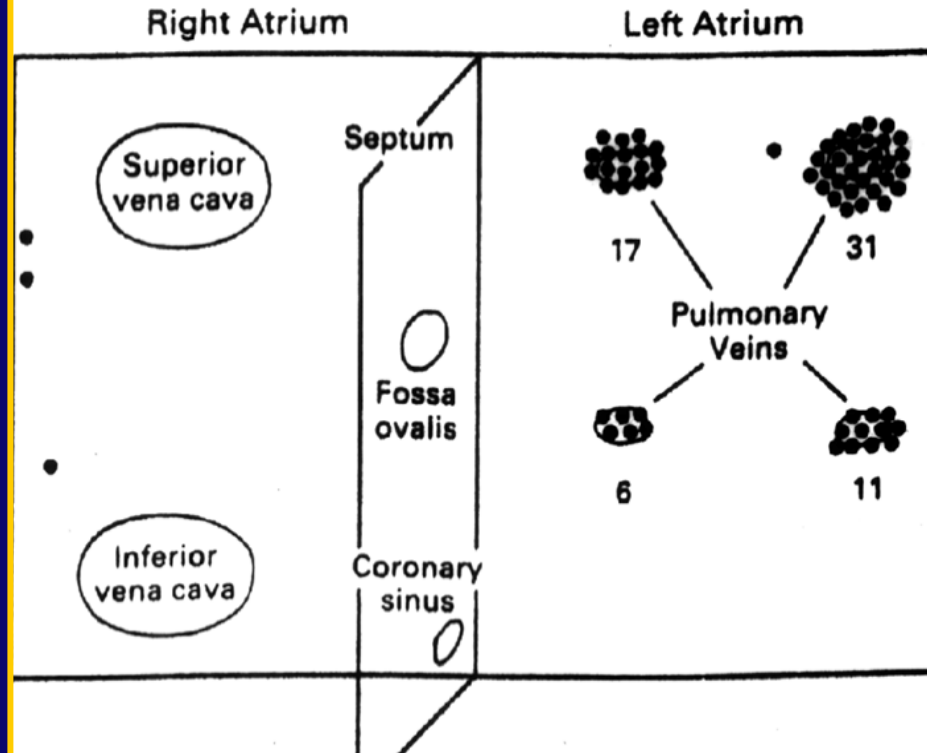
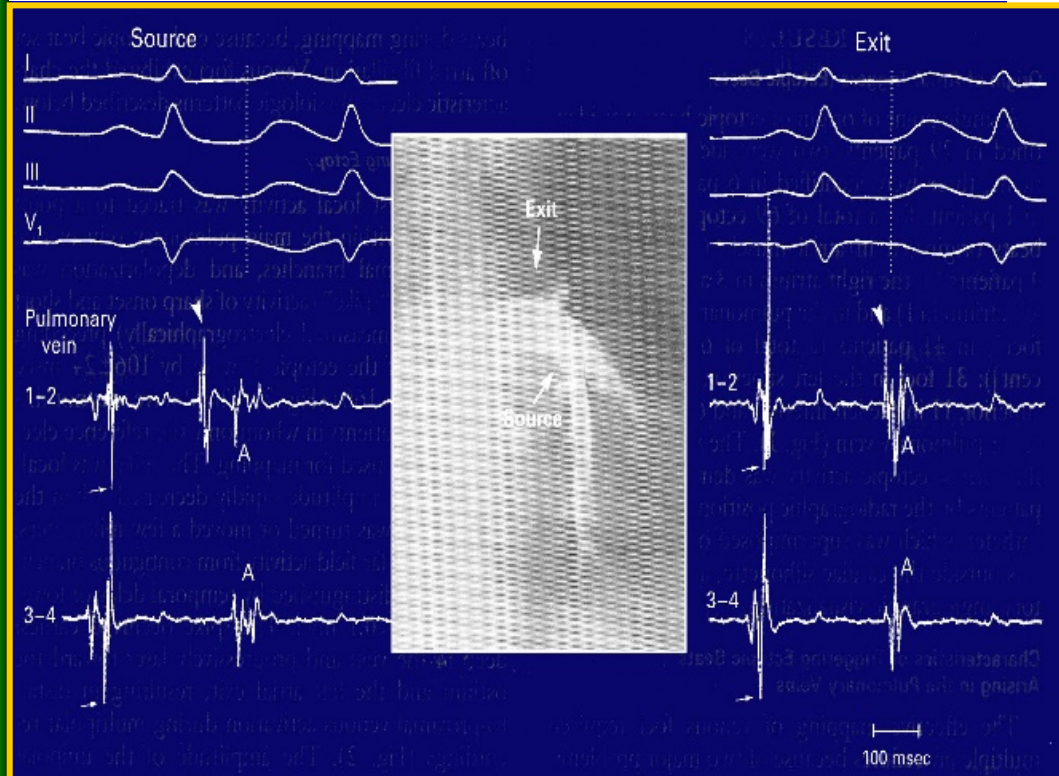
ANS

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.



The NEW ENGLAND
JOURNAL of MEDICINE
1998;339:659-666



45 pts with
idiopathic PAF

F/up: 8 ± 6 mths

62%
success rate

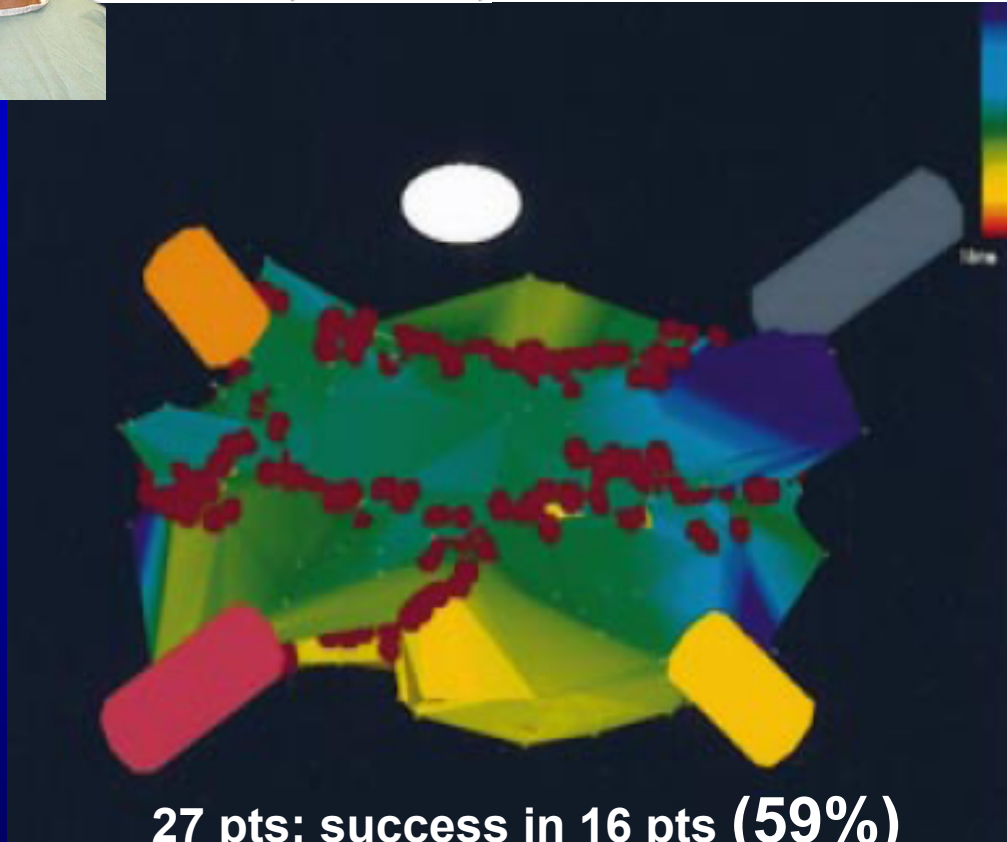
Electroanatomic mapping systems

Substrate & *triggers* modification



Catheter Ablation of Paroxysmal Atrial Fibrillation Using a 3D Mapping System

Carlo Pappone, MD; Giuseppe Oreto, MD; Filippo Lamberti, MD; Gabriele Vicedomini, MD; Maria Luisa Loricchio, MD; Shlomo Shpun, DSc; Mariano Rillo, MD; Maria Pia Calabrò, MD; Andrea Conversano, MD; Shlomo A. Ben-Haim, MD, DSc; Riccardo Cappato, MD; Sergio Chierchia, MD
(*Circulation*. 1999;100:1203-1208.)



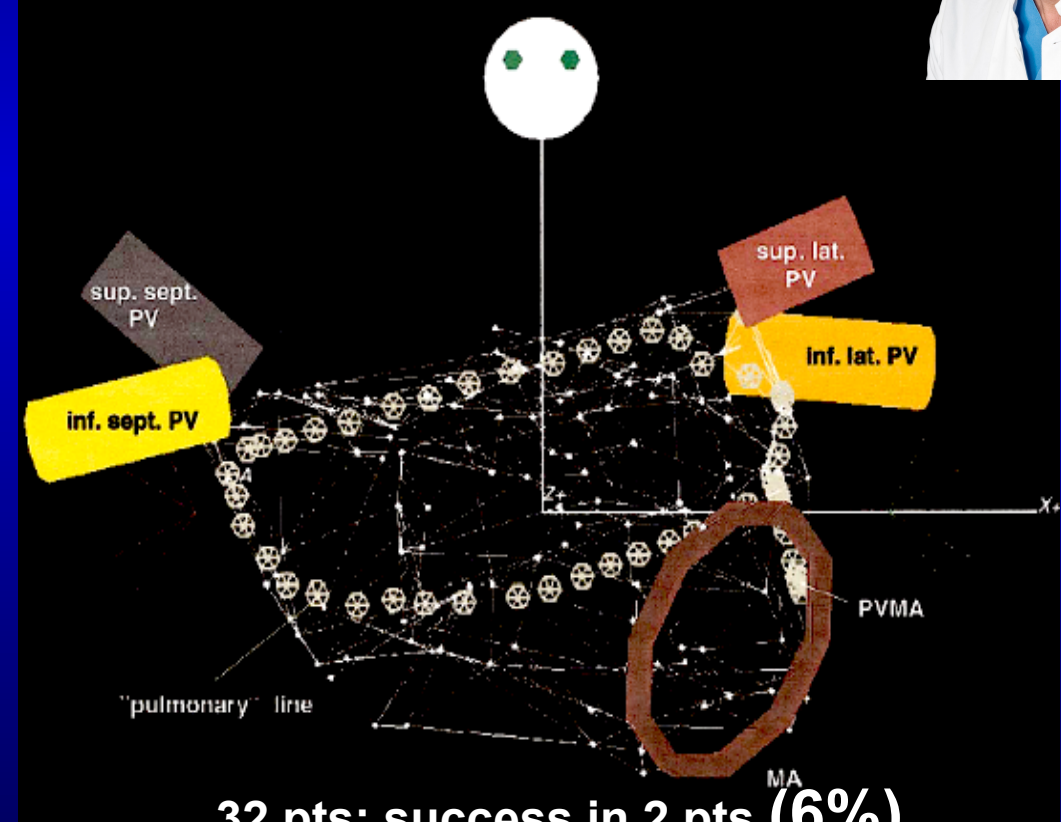
27 pts: success in 16 pts (59%)

Modification of the Substrate for Maintenance of Idiopathic Human Atrial Fibrillation

Efficacy of Radiofrequency Ablation Using Nonfluoroscopic Catheter Guidance

Sabine Ernst, MD; Michael Schlüter, PhD; Feifan Ouyang, MD; Afsaneh Khanedani, MD; Riccardo Cappato, MD; Joachim Hebe, MD; Marius Volkmer, MD; Matthias Antz, MD; Karl-Heinz Kuck, MD

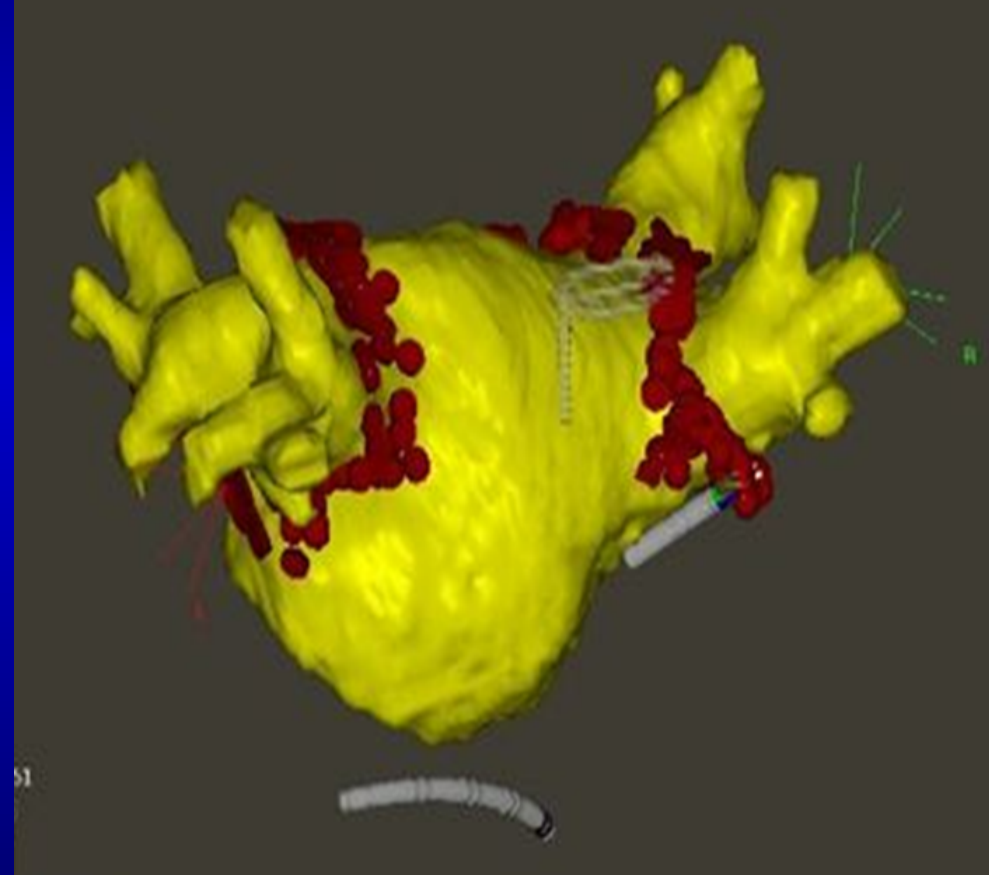
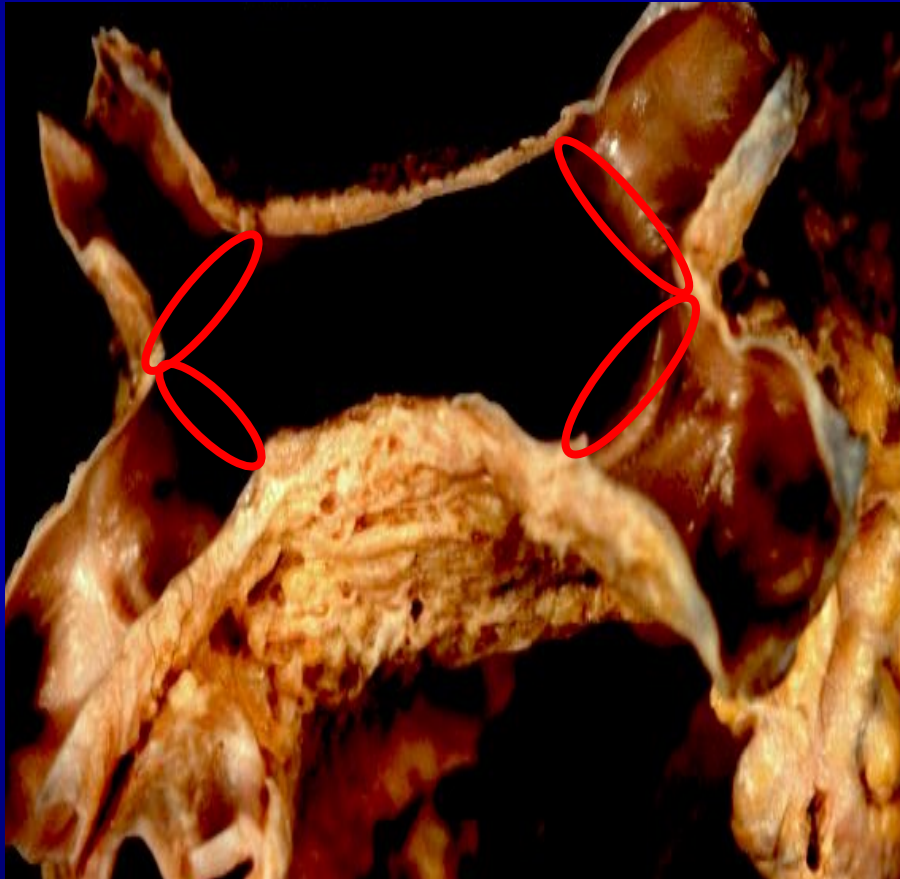
(*Circulation*. 1999;100:2085-2092.)



32 pts: success in 2 pts (6%)

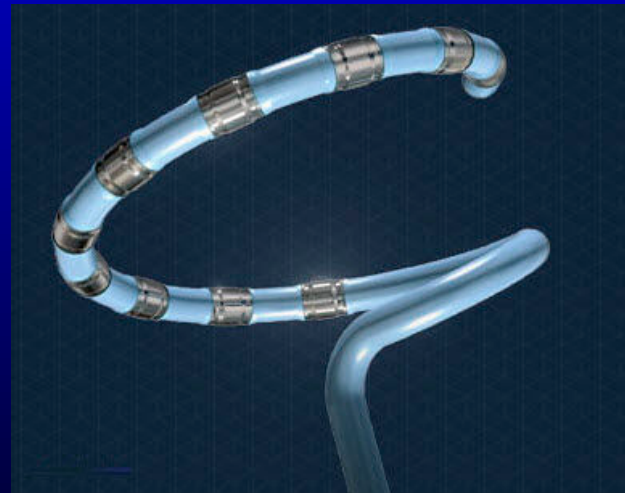
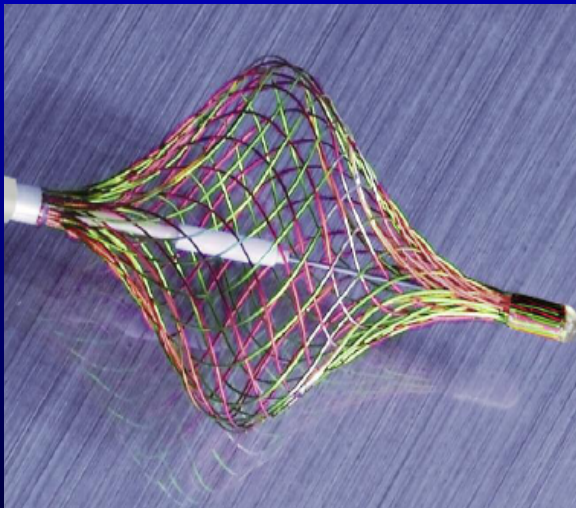
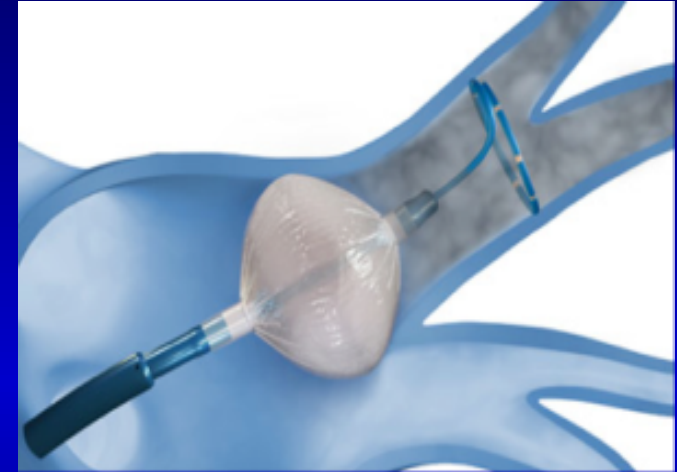
PV ablation as anatomical target

Is the easiest way to perform AF ablation



Courtesy of Dr. Damian Sanchez-Quintana

the first decade of the 2000s is characterized by the arrival of
new tools and new energy sources



The question that arose in the early 2000s (still debated today) was:

**How effective is
P V isolation alone
in treating patients with
persistent AF or
Structural Heart Disease**

- Valvular heart disease
- Hypertrophic cardiomyopathy
- Heart Failure

????

Linear Cryoablation of the Left Atrium Versus Pulmonary Vein Cryoisolation in Patients With Permanent Atrial Fibrillation and Valvular Heart Disease

Correlation of Electroanatomic Mapping and Long-Term Clinical Results

Fiorenzo Gaita, MD; Riccardo Riccardi, MD; Domenico Caponi, MD; Dipen Shah, MD;
Lucia Garberoglio, MD; Laura Vivalda, MD; Alessandro Dulio, BS; Andrea Chiecchio, PhD;
Eric Manasse, MD; Roberto Gallotti, MD

American Heart
Association®
Learn and Live™

Circulation

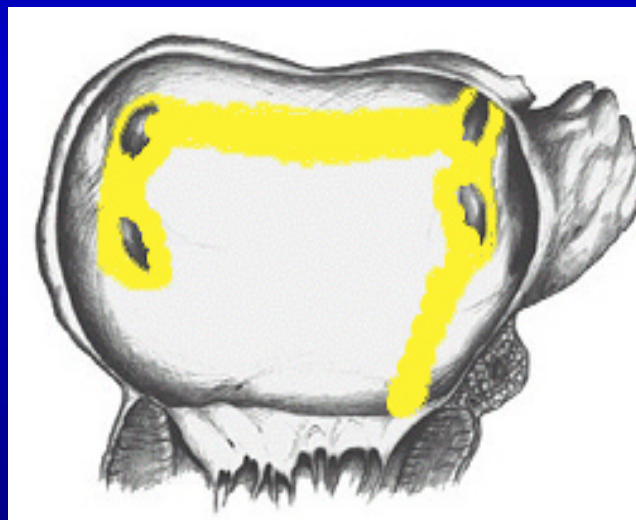
JOURNAL OF THE AMERICAN HEART ASSOCIATION

2005;111:136-42

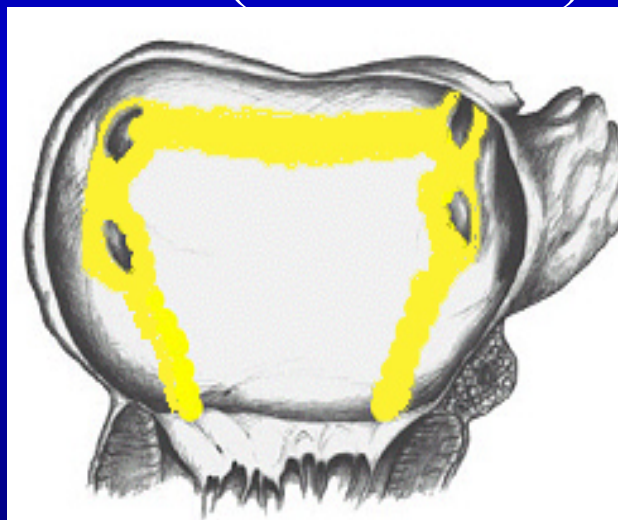
105 pts, Permanent AF **and** Valvular Heart Disease (33% FMR)



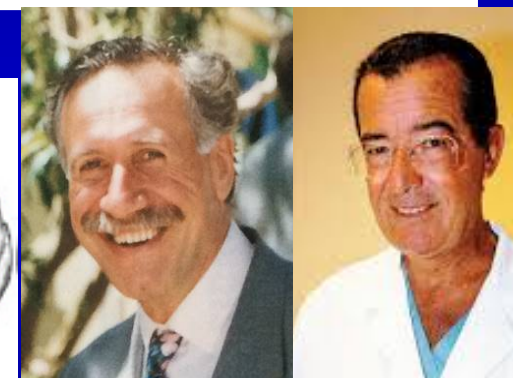
**VP
Isolation**



**7
Lesion**



**reversed U
Lesion**



Linear Cryoablation of the Left Atrium Versus Pulmonary Vein Cryoisolation in Patients With Permanent Atrial Fibrillation and Valvular Heart Disease

Correlation of Electroanatomic Mapping and Long-Term Clinical Results

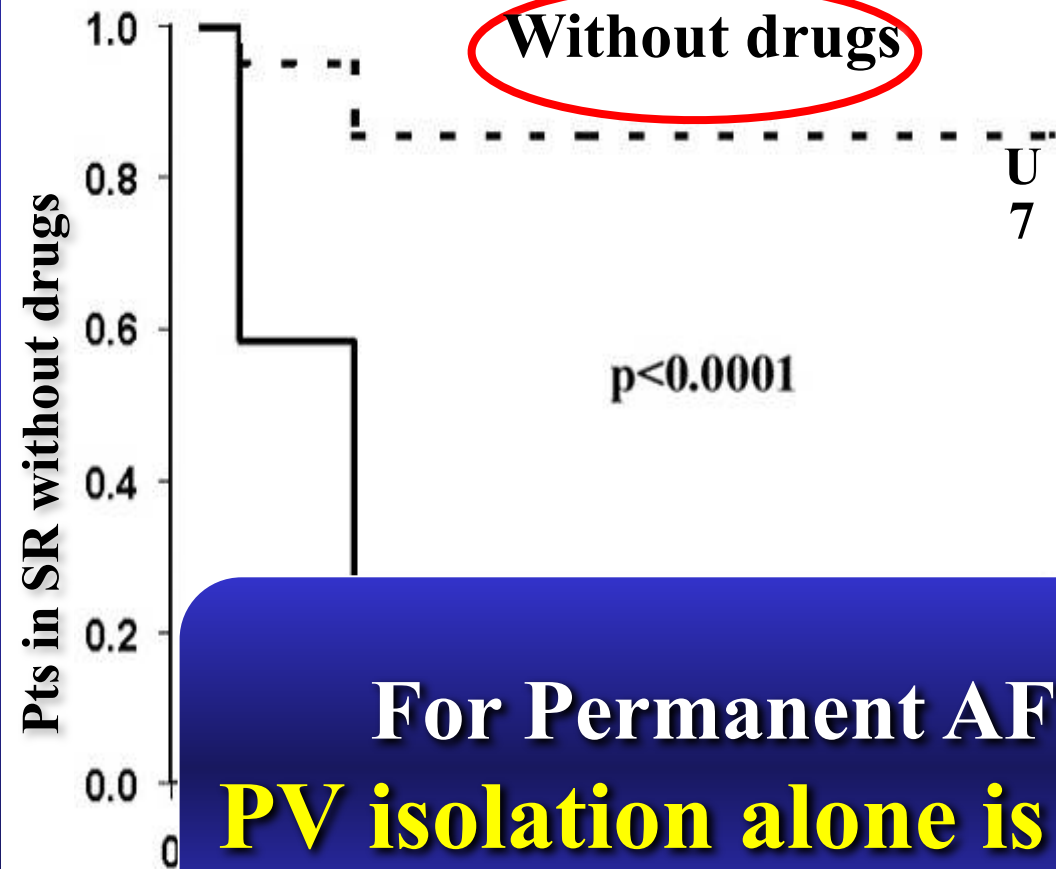
Fiorenzo Gaita, MD; Riccardo Ricciardi, MD; Domenico Caponi, MD; Dipen Shah, MD; Lucia Garberoglio, MD; Laura Vivalda, MD; Alessandro Dulio, BS; Andrea Chiecchio, PhD; Eric Manasse, MD; Roberto Gallotti, MD

American Heart Association
Learn and Live™

Circulation

JOURNAL OF THE AMERICAN HEART ASSOCIATION

2005;111:136-42

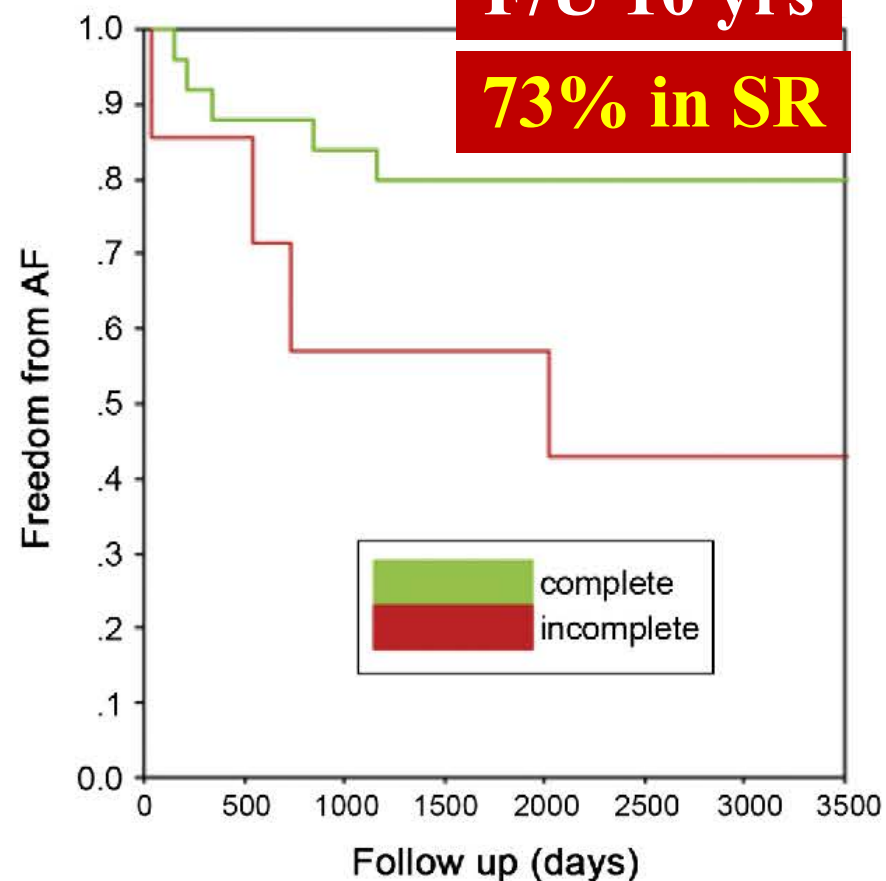


**For Permanent AF and V.H.D
PV isolation alone is not sufficient**

**Permanent AF
and
Valvular Heart Disease**

Fiorenzo Gaita, MD, Elisa Ebrille, MD, Marco Scaglione, MD, Domenico Caponi, MD,
Lucia Garberoglio, MD, Laura Vivalda, MD, Alessandro Barbone, MD, PhD,
and Roberto Gallotti, MD

Fiorenzo Gaita, MD, Elisa Ebrille, MD, Marco Scaglione, MD, Domenico Caponi, MD,
Lucia Garberoglio, MD, Laura Vivalda, MD, Alessandro Barbone, MD, PhD,
and Roberto Gallotti, MD



2013;96:1273–8

Fioranzeno Galla, MD, Elia Ferilli, MD, Marco Scapellato, MD, Domenico Caponi, MD, Lucia Carluccioglio, MD, Lucia Vivalda, MD, Alessandro Barbieri, MD, PhD, and Roberto Gallati, MD

Department of Cardiology, School of Medicine, University of Turin, Turin, Department of Cardiology, Cardiac Research Hospital, and Department of Cardiac Surgery, Istituto Clinico Humanitas IRCCS, Rozzano, Italy

Background: New hybrid approaches for atrial fibrillation (AF) ablation, combining surgical and percutaneous procedures, are sought to enhance the long-term success rate of these 2 procedures separately considered. Recent studies have underlined the need for intensive

[illegible]

© 2002 by The Society of Thoracic Surgeons

[illegible]

Copyright © 2004 John Wiley & Sons, Ltd.

© 2005 by The Society for Human Development
Full text of this article is available at
<http://www.intellectonline.com>

Long-Term Clinical Results of 2 Different Ablation Strategies in Patients With Paroxysmal and Persistent Atrial Fibrillation
Fiorenzo Gaita, Domenico Caponi, Marco Scaglione, Antonio Montefusco, Antonella Corleto, Fernando Di Monte, Daniele Coin, Paolo Di Donna and Carla Giustetto

Circulation
Arrhythmia and Electrophysiology

2008;1:269-275

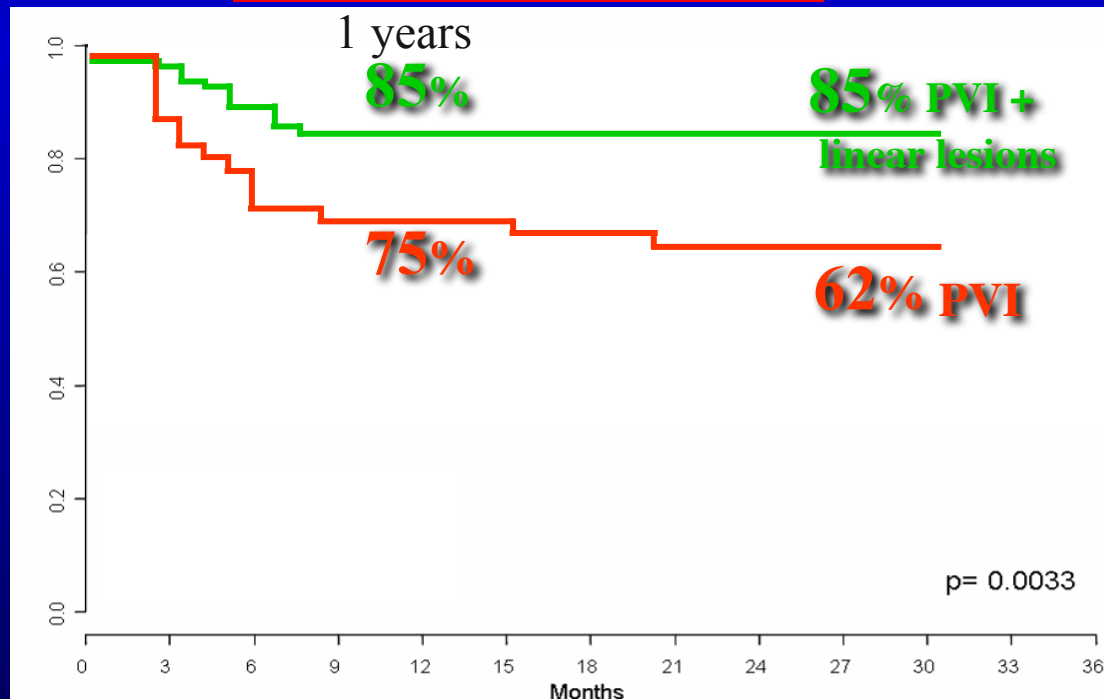


Long-term results (33 months) of 2 different schemes:

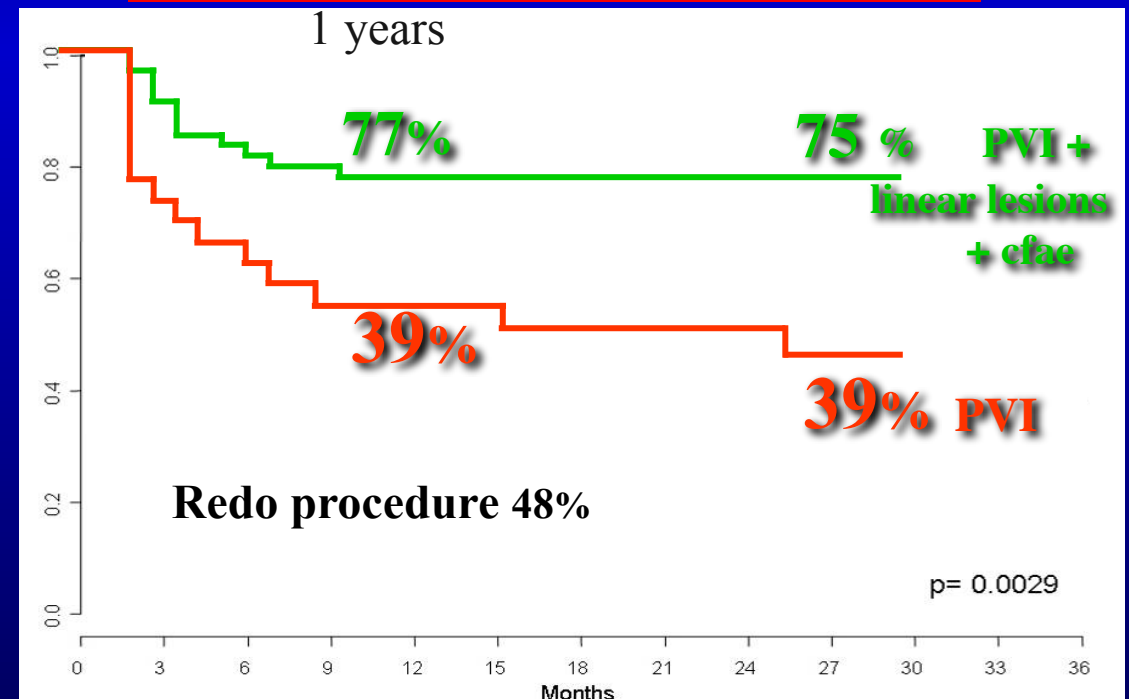
PVI vs PVI + linear lesions

204 pts

Paroxysmal AF



Persistent/Permanent AF



The Atrial Fibrillation **S**

Different AF for:

atrial volume,
substrate,
endocardial mapping,

and **Different Ablation strategy**

WPW

SSS

idiopathic

vagal

adrenergic

HF

CMP

valvular

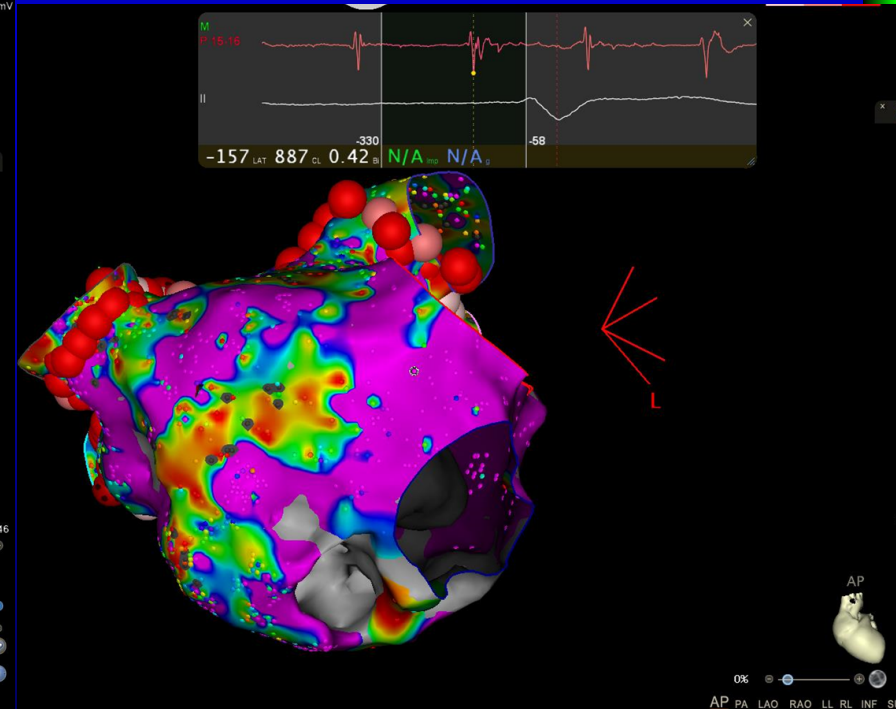
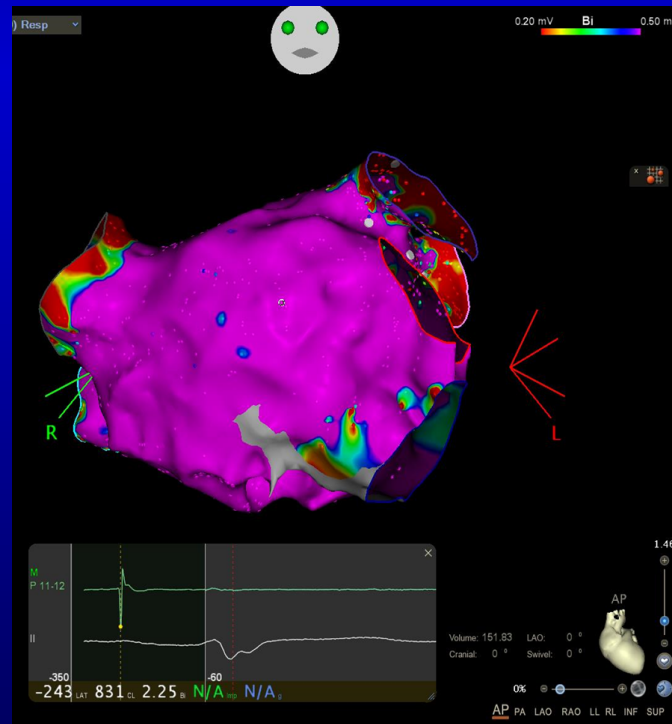
Persistent
AF

hypertensive
heart
disease

Channelopathies

Brugada

Short QT



Very long-term outcome following transcatheter ablation of atrial fibrillation. Are results maintained after 10 years of follow up?

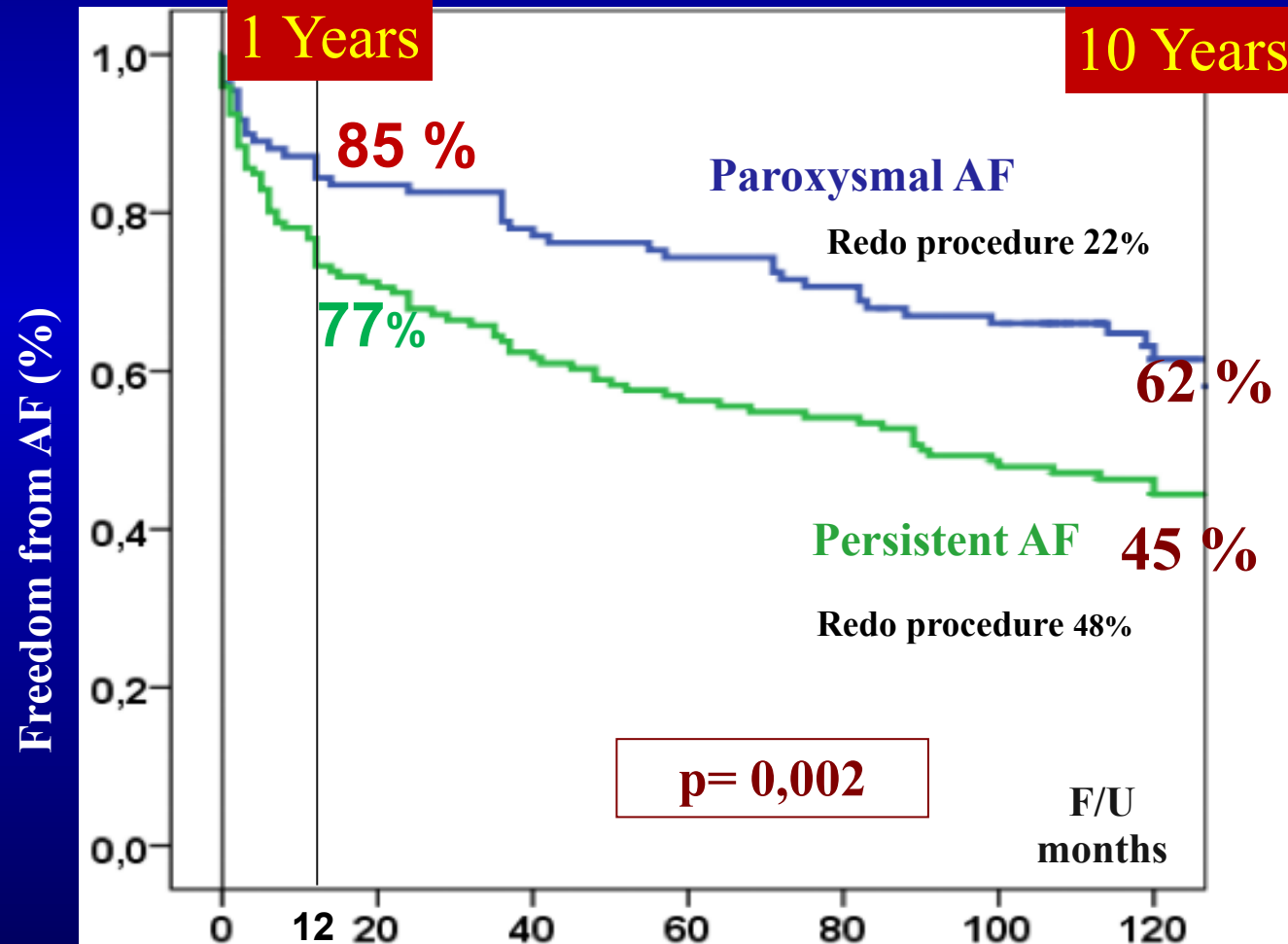
Fiorenzo Gaita^{1*}, Marco Scaglione², Alberto Battaglia¹, Mario Matta¹, Cristina Gallo¹, Michela Galatà¹, Domenico Caponi², Paolo Di Donna², and Matteo Anselmino¹



ESC

European Society
of Cardiology

Europace (2018) 20, 443–450



Results at **1 Year** and after a
Long-term follow Up
(**10 Years**) in 255 pts with

Paroxysmal AF
&
Persistent AF



ESC

European Society
of Cardiology

Europace (2018) 20, 443–450
doi:10.1093/europace/eux008

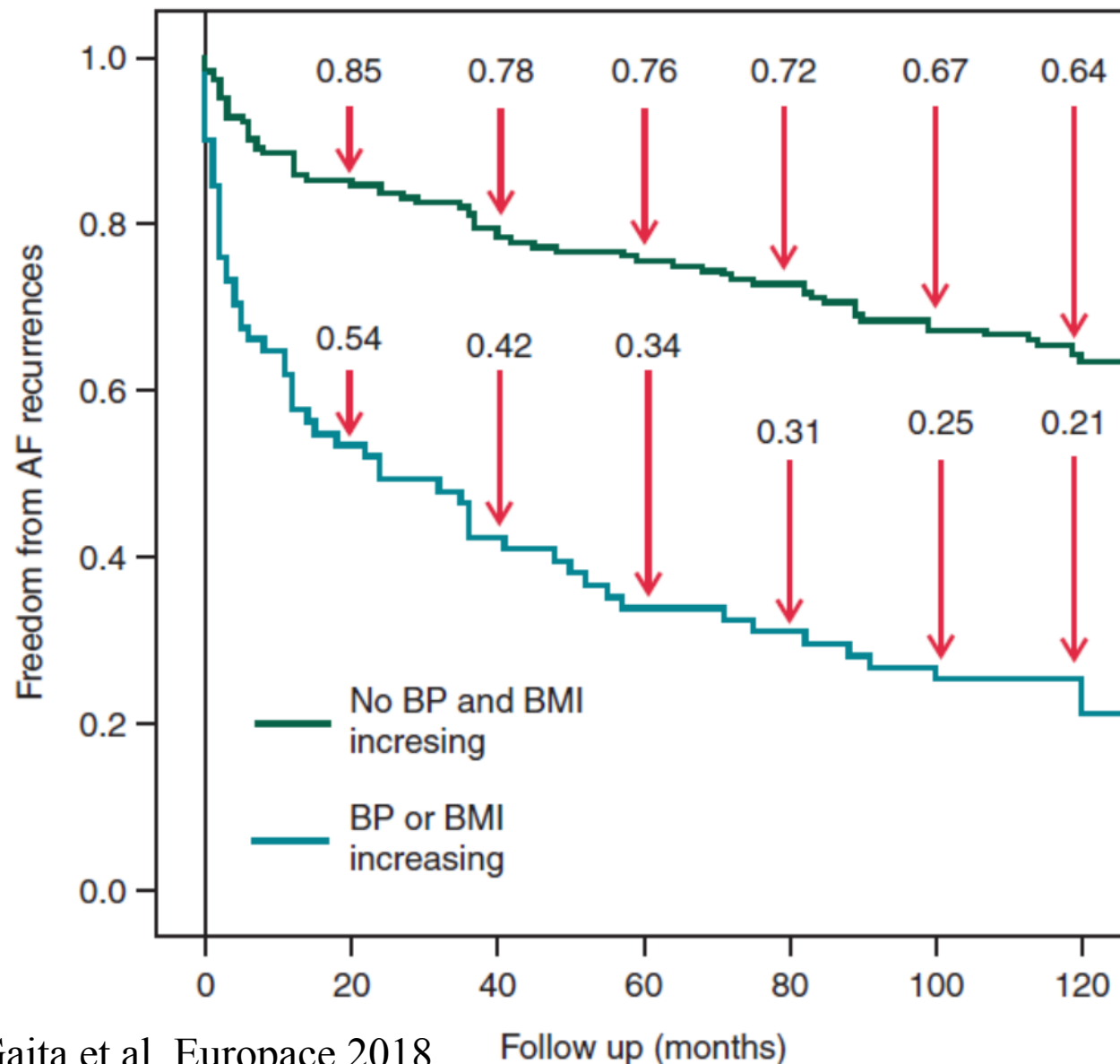
Very long-term outcome after catheter ablation of atrial fibrillation maintained after 10 years

Fiorenzo Gaita^{1*}, Marco Scaglione²,
Cristina Gallo¹, Michela Galatà¹, Donato
Matteo Anselmino¹

Risk factors
influence on long-
term outcomes
of AF ablation:

- BMI
- Hypertension
- Diabetes

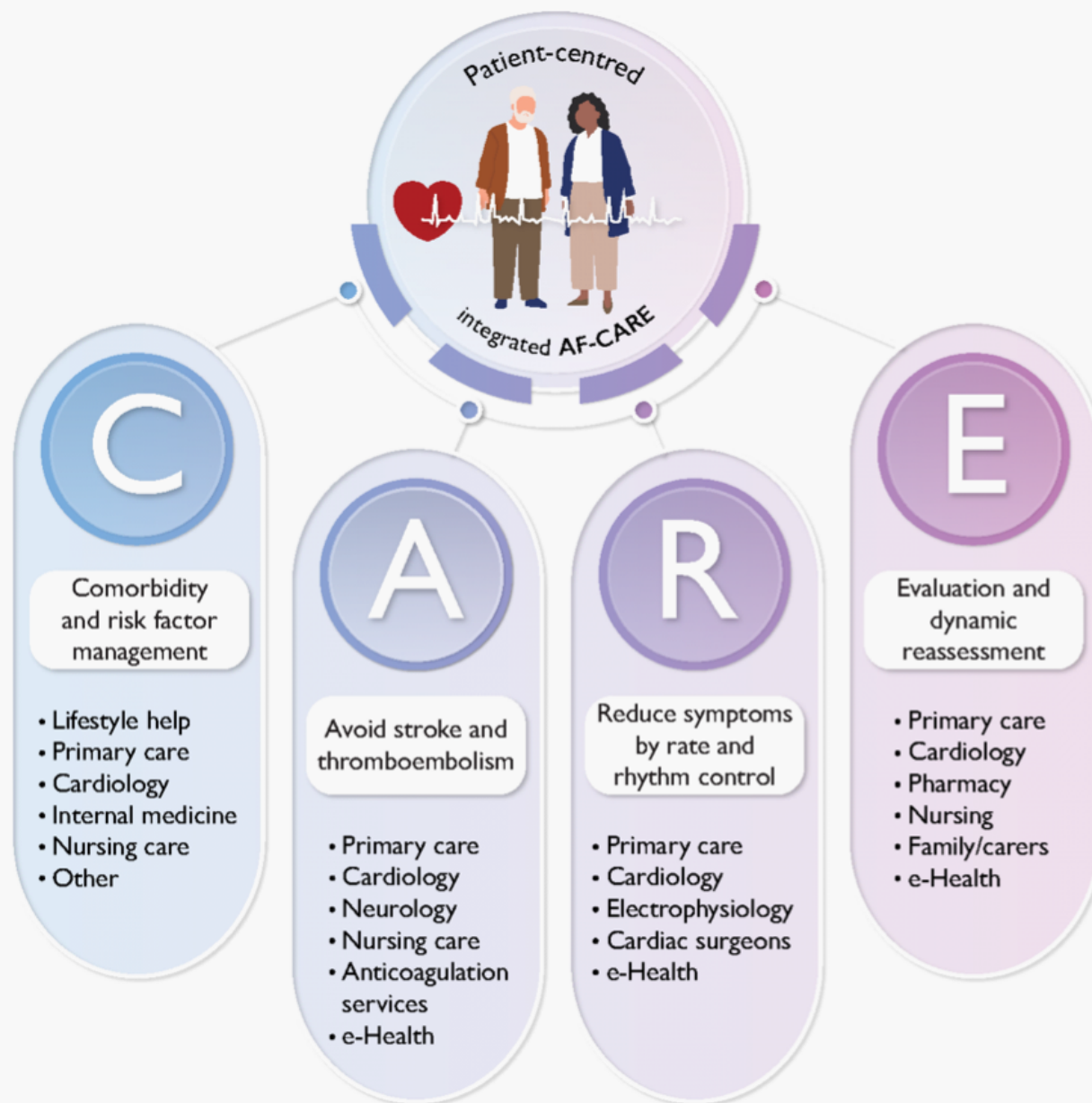
Long term outcome following AF ablation according
to risk factor control (redo procedure)



Gaita et al. Europace 2018

Follow up (months)

Atrial fibrillation



2024 ESC Guidelines for the management of atrial fibrillation developed in collaboration with the European Association for Cardio-Thoracic Surgery (EACTS)

Developed by the task force for the management of atrial fibrillation of the European Society of Cardiology (ESC), with the special contribution of the European Heart Rhythm Association (EHRA) of the ESC.
Endorsed by the European Stroke Organisation (ESO)

Authors/Task Force Members: Isabelle C. Van Gelder [✉]*,[†] (Chairperson) (Netherlands), Michiel Rienstra [✉]*,[‡] (Task Force Co-ordinator) (Netherlands), Karina V. Bunting [✉]*,[‡] (Task Force Co-ordinator) (United Kingdom), Ruben Casado-Arroyo [✉] (Belgium), Valeria Caso [✉]*,¹ (Italy), Harry J.G.M. Crijns [✉] (Netherlands), Tom J.R. De Potter [✉] (Belgium), Jeremy Dwight (United Kingdom), Luigina Guasti [✉] (Italy), Thorsten Hanke [✉]*,² (Germany), Tiny Jaarsma [✉] (Sweden), Maddalena Lettino [✉] (Italy), Maja-Lisa Løchen [✉] (Norway), R. Thomas Lumbers [✉] (United Kingdom), Bart Maesen [✉]*,² (Netherlands), Inge Mølgaard (Denmark), Giuseppe M.C. Rosano (United Kingdom), Prashanthan Sanders [✉] (Australia), Renate B. Schnabel [✉] (Germany), Piotr Suwalski [✉]*,² (Poland), Emma Svennberg [✉] (Sweden), Juan Tamargo [✉] (Spain), Otilia Tica [✉] (Romania), Vassil Traykov [✉] (Bulgaria), Stylianos Tzeis (Greece), Dipak Kotecha [✉]*,[†] (Chairperson) (United Kingdom), and ESC Scientific Document Group

* Corresponding authors: Isabelle C. Van Gelder, Department of Cardiology, University of Groningen, University Medical Center Groningen, Groningen, Netherlands. Tel: +31 50 361 1327. Email: i.vangelder@univgr.nl and Dipak Kotecha, Institute of Cardiovascular Sciences, University of Birmingham, United Kingdom & NIHR Birmingham Biomedical Research Centre, University Hospitals Birmingham NHS Foundation Trust, Birmingham, United Kingdom. Tel: +44 121 321 8124. Email: d.kotecha@bham.ac.uk

[†] The two Chairpersons contributed equally to the document and are joint corresponding authors.

[‡] The two Task Force Co-ordinators contributed equally to the document.

Author/Task Force Member affiliations are listed in author information.

¹ Representing European Stroke Organisation (ESO).

² Representing European Association for Cardio-Thoracic Surgery (EACTS).

ESC Clinical Practice Guidelines (CPG) Committee: listed in the Appendix.

ESC subspecialty communities having participated in the development of this document:

Associations: Association of Cardiovascular Nursing & Allied Professions (ACNAP), Association for Acute CardioVascular Care (AACV), European Association of Cardiovascular Imaging (EACVI), European Association of Preventive Cardiology (EAPC), European Association of Percutaneous Cardiovascular Interventions (EAPCI), European Heart Rhythm Association (EHRA), Heart Failure Association (HFA).

Councils: Council for Cardiology Practice, Council of Cardio-Oncology, Council on Cardiovascular Genomics, Council on Stroke.

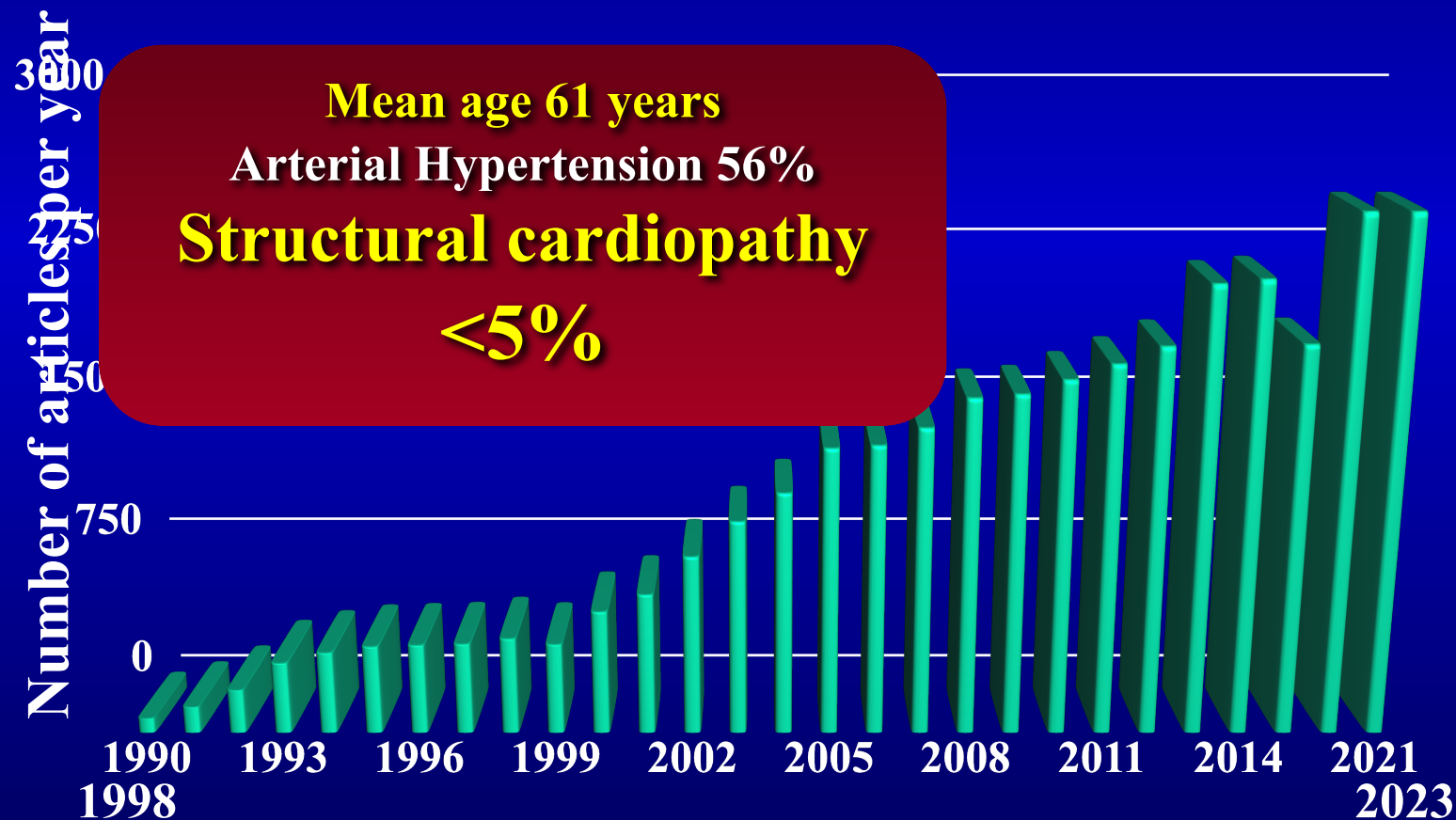
Working Groups: Cardiac Cellular Electrophysiology, Cardiovascular Pharmacotherapy, E-Cardiology, Thrombosis.

Patient Forum

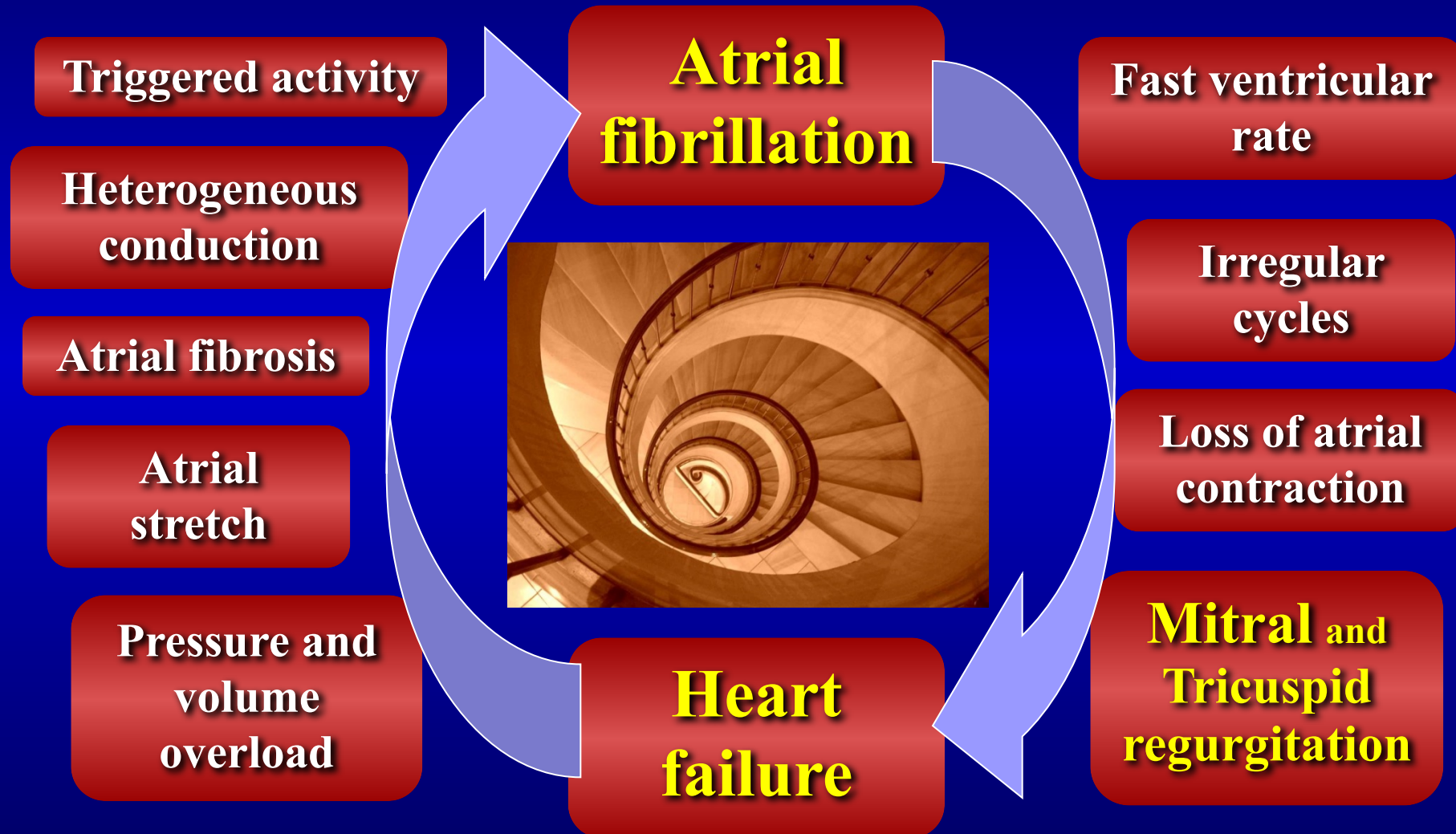
© The European Society of Cardiology 2024. All rights reserved. For permissions, please email: journals.permissions@oup.com.

In medicine when something works it spreads worldwide

Publications over the years on AF ablation



Atrial fibrillation and Heart failure





Catheter Ablation of Atrial Fibrillation in Patients With Left Ventricular Systolic Dysfunction: A Systematic Review and Meta-Analysis

Matteo Anselmino, Mario Matta, Fabrizio D'Ascenzo, T. Jared Bunch, Richard J. Schilling, Ross J. Hunter, Carlo Pappone, Thomas Neumann, Georg Noelker, Martin Fiala, Emanuele Bertaglia, Antonio Frontera, Edward Duncan, Chrishan Nalliah, Pierre Jais, Rukshen Weerasooriya, Jon M. Kalman and Fiorenzo Gaita



Multicenter meta-analysis 25 studies, **1,838 patients** from 9 countries



Rhythm control by AF ablation in HF
has been shown to improve
quality of life, LVEF
and **reduce ICD indications...**

Drug therapy versus ablation

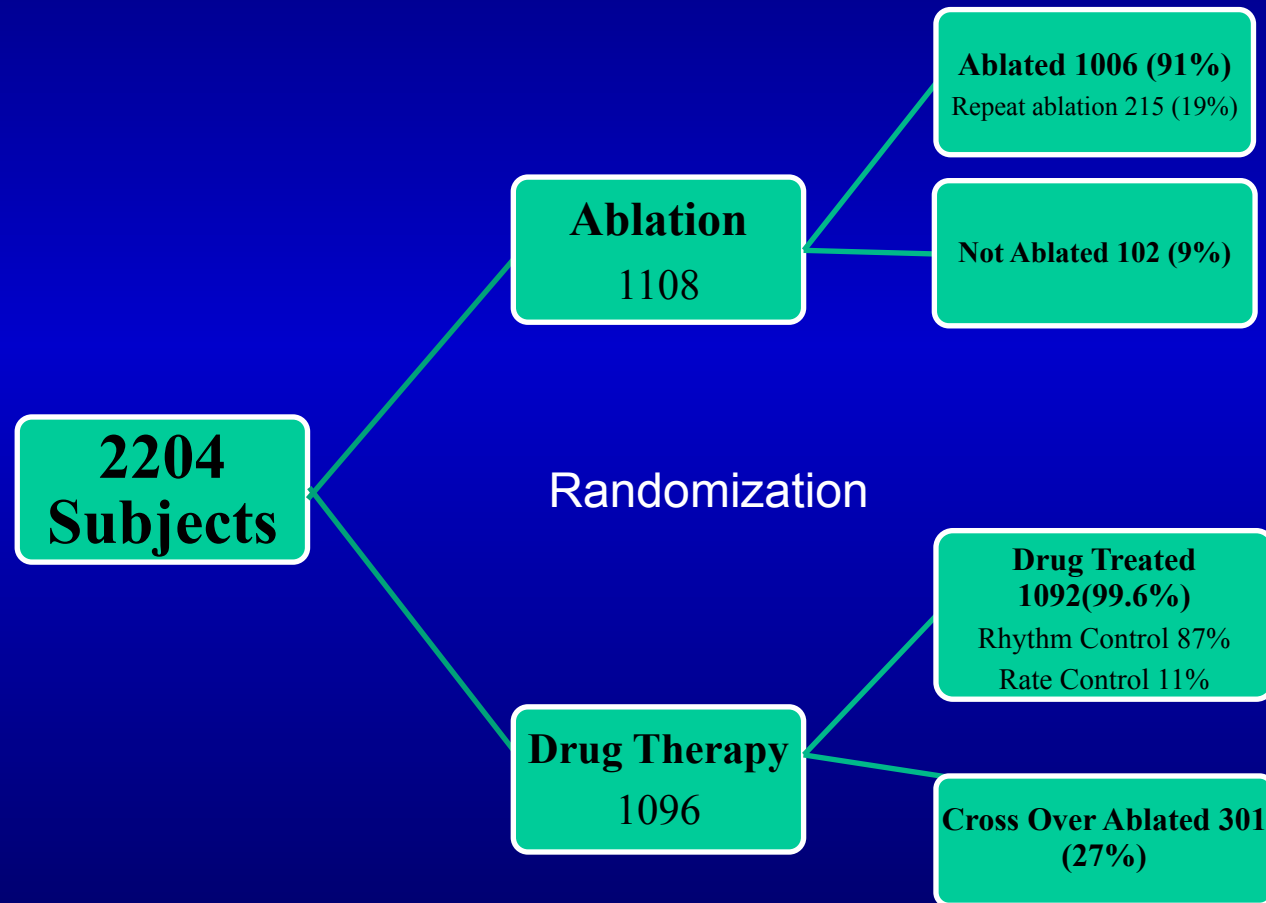
CABANA TRIAL

Primary Endpoint:

All-cause mortality, disabling stroke, serious bleeding, or cardiac arrest

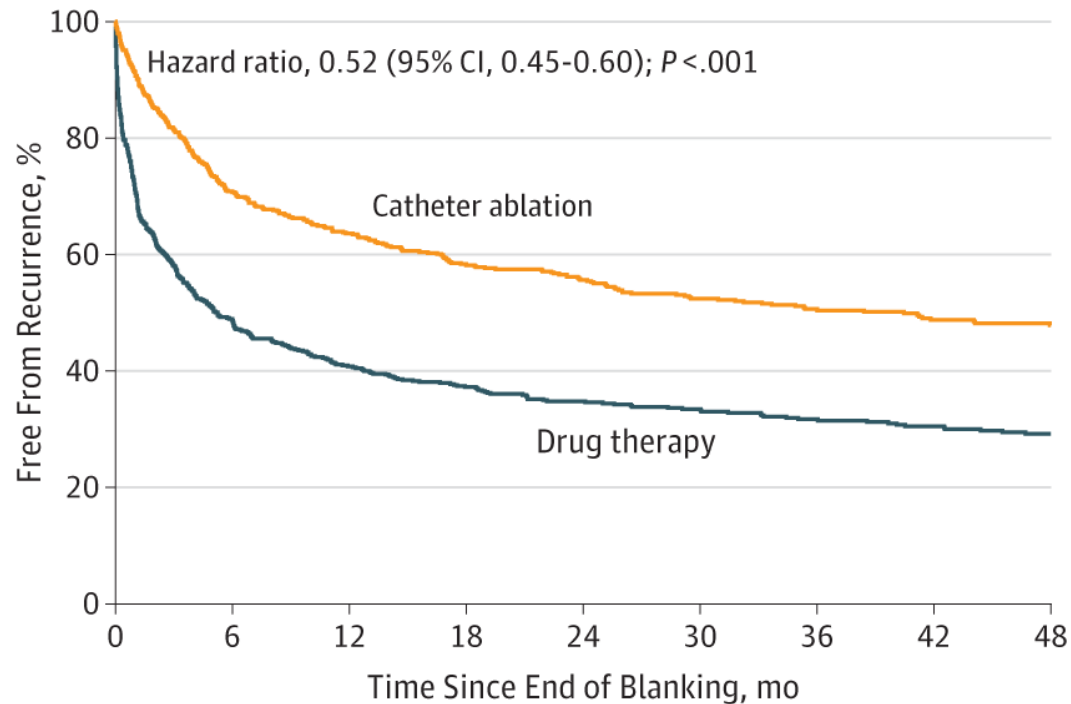
126 centers in 10 countries; pts enrolled 2009-2016

AF Monitoring:
Event recorder for symptoms
24-96 hour holter every 3 months



CABANA TRIAL

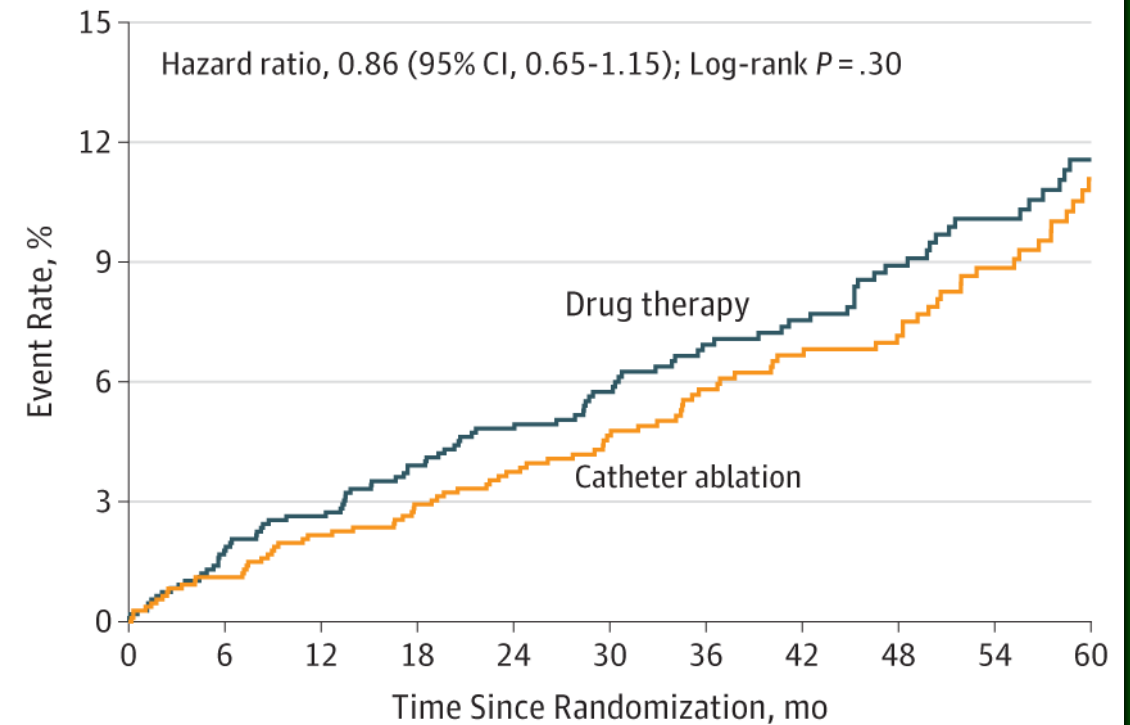
Atrial Fibrillation/Flutter



No. at risk									
Drug therapy	629	304	252	212	181	157	131	115	94
Catheter ablation	611	432	381	328	291	241	201	163	134

Primary Composite Endpoint

Death, Disabling Stroke, Serious Bleeding, or Cardiac Arrest



No. at risk											
Drug therapy	1096	1036	1006	970	880	763	652	578	499	418	312
Catheter ablation	1108	1045	1021	996	915	793	700	614	535	432	309

778 pts
HF

Ablation

378

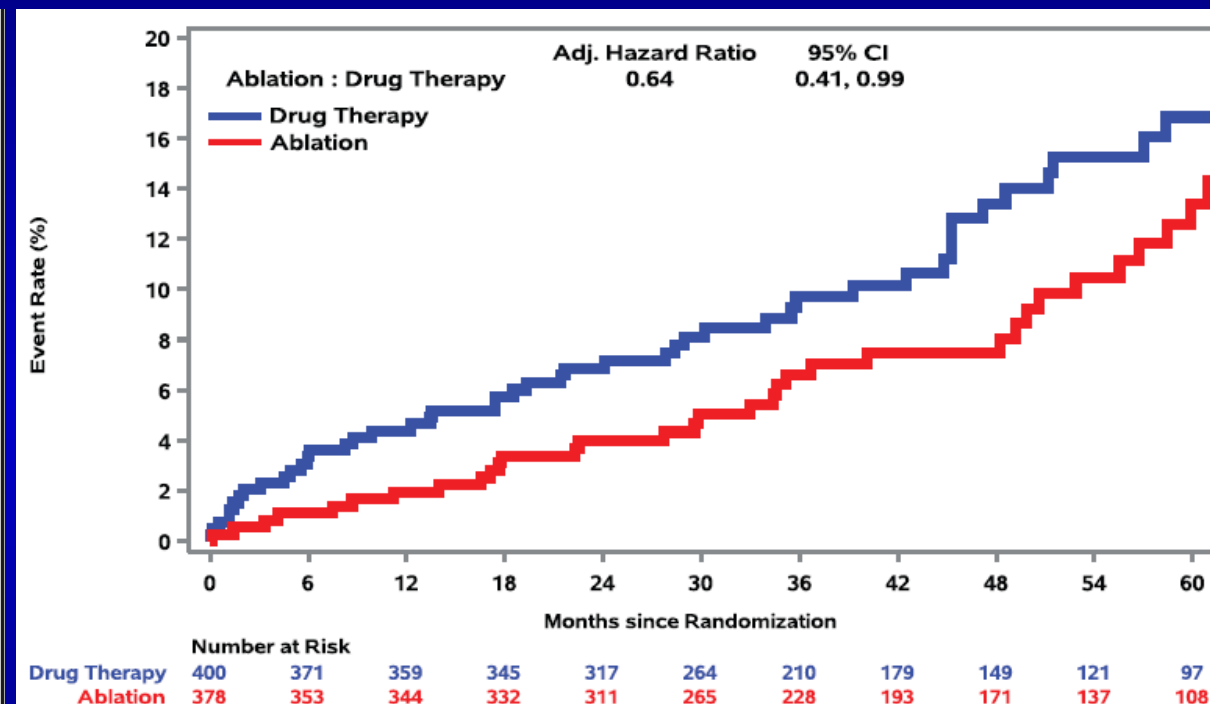
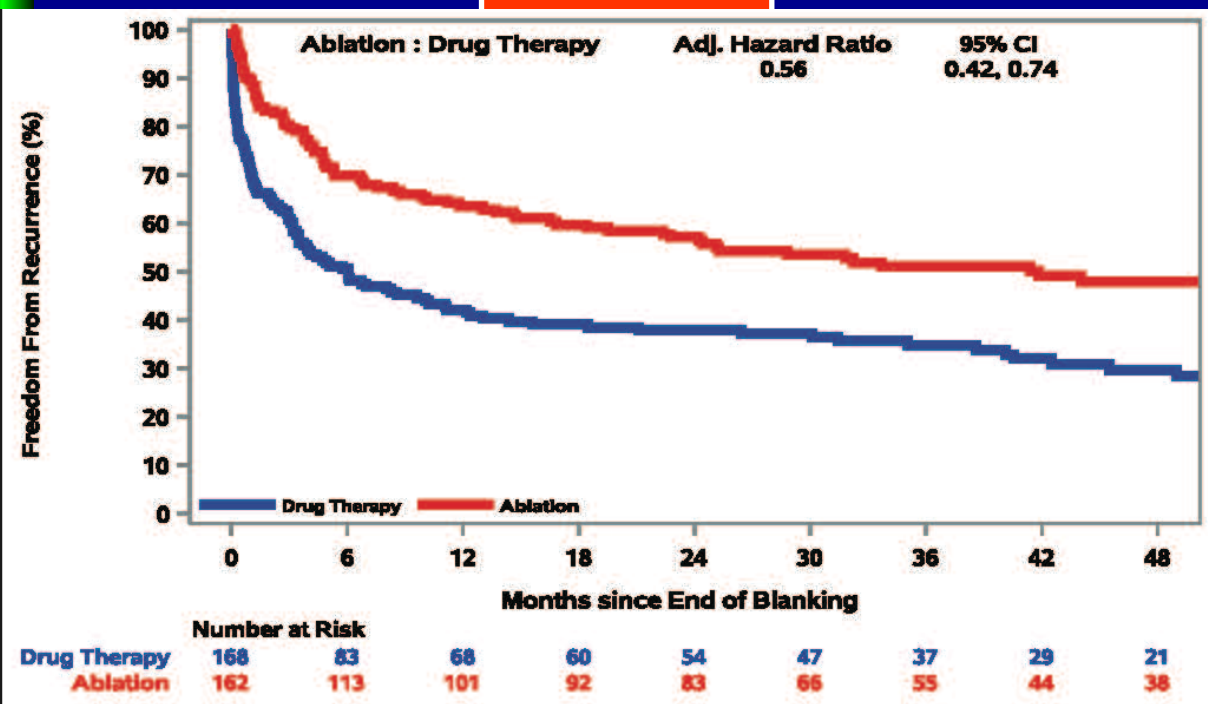
Drug Therapy

400

Ablation Versus Drug Therapy for Atrial Fibrillation in Heart Failure

Results From the CABANA Trial

D.L. Packer et al. 2021;143:1377–1390



-43% All-cause mortality

AF pts with HF

improved QoL and reductions in Mortality

Figure 5

[R] Pathway for
patients with
paroxysmal atrial
fibrillation

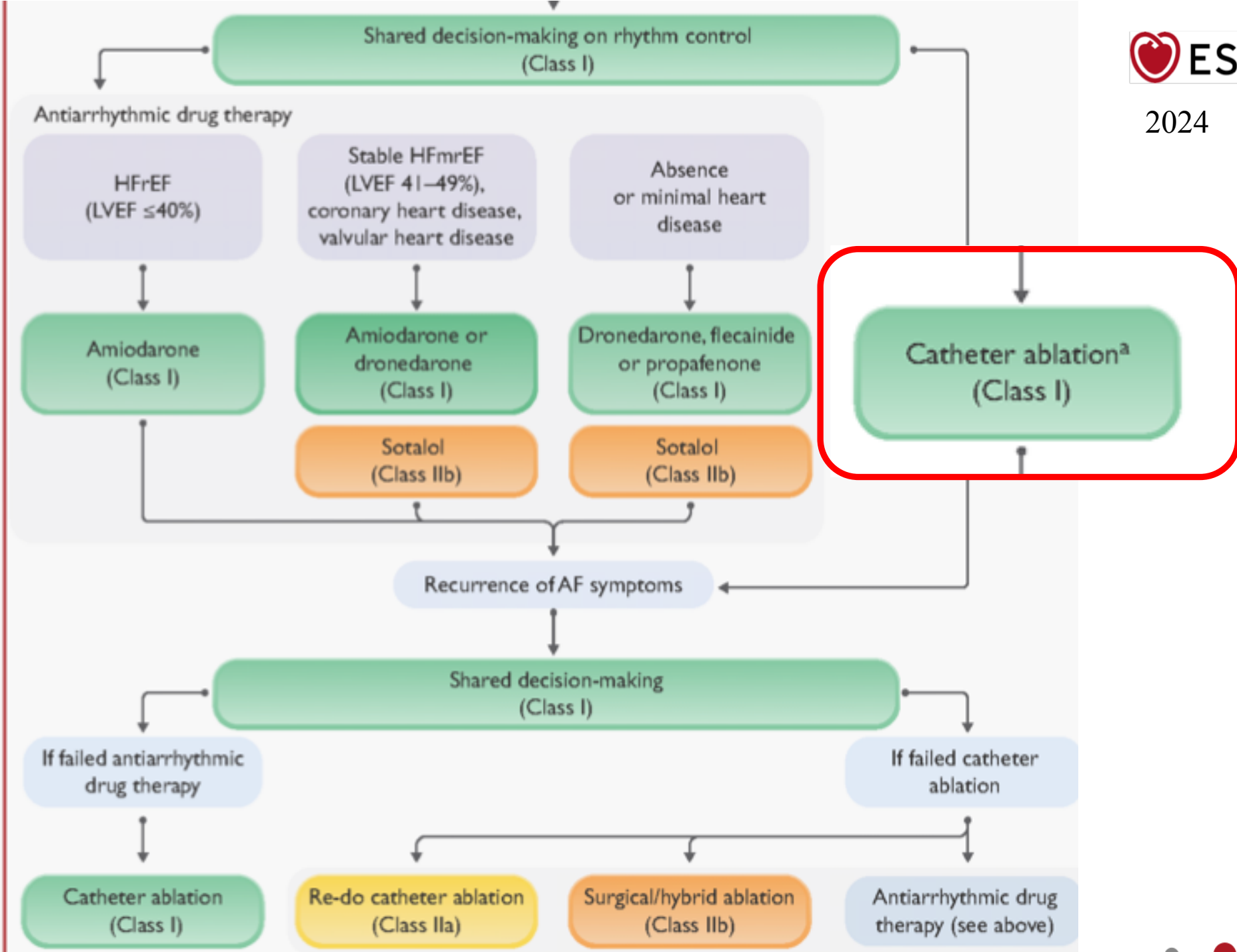
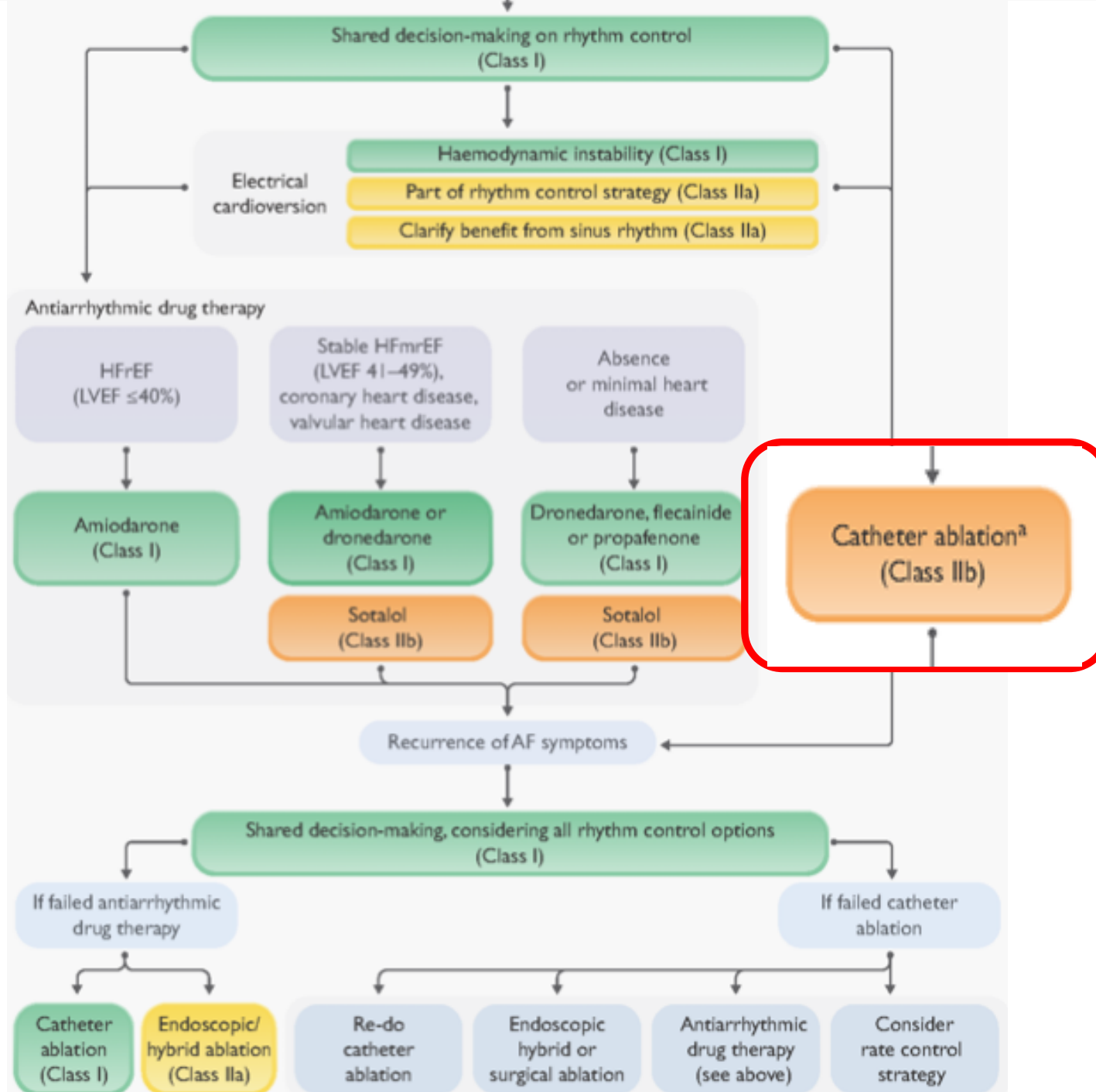
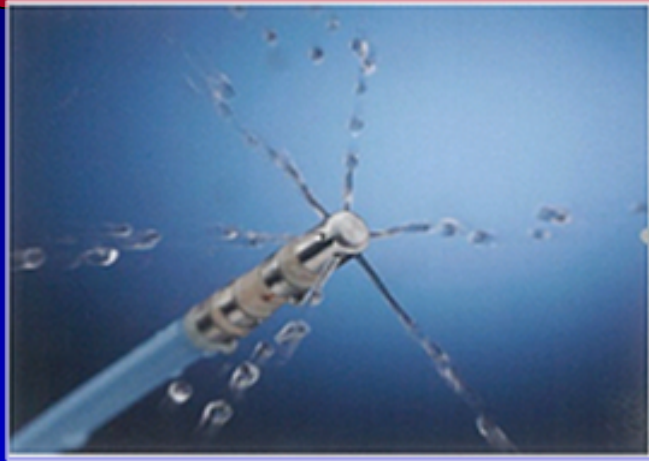


Figure 6

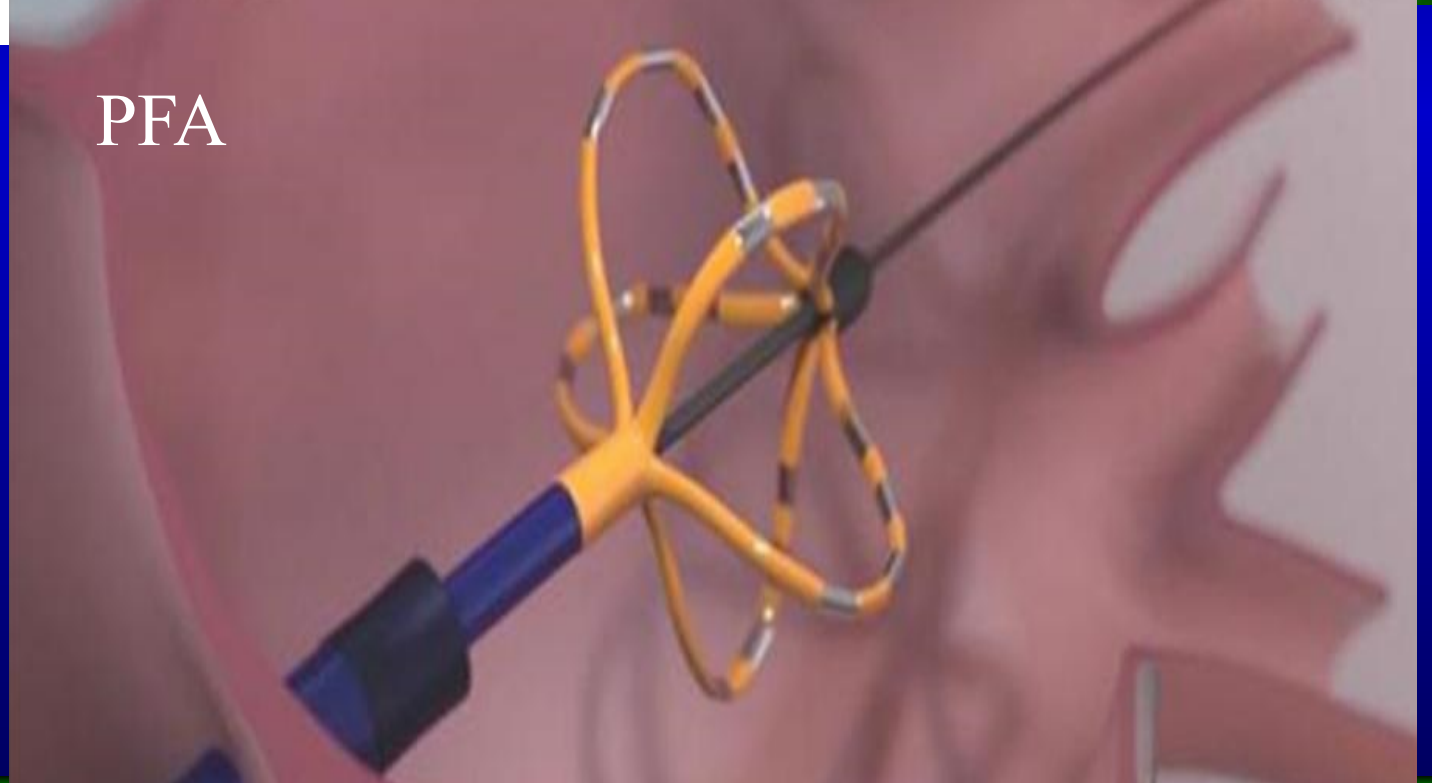
[R] Pathway for patients with persistent atrial fibrillation



2020 PFA new sources of energy



PFA



MANIFEST-PF Survey

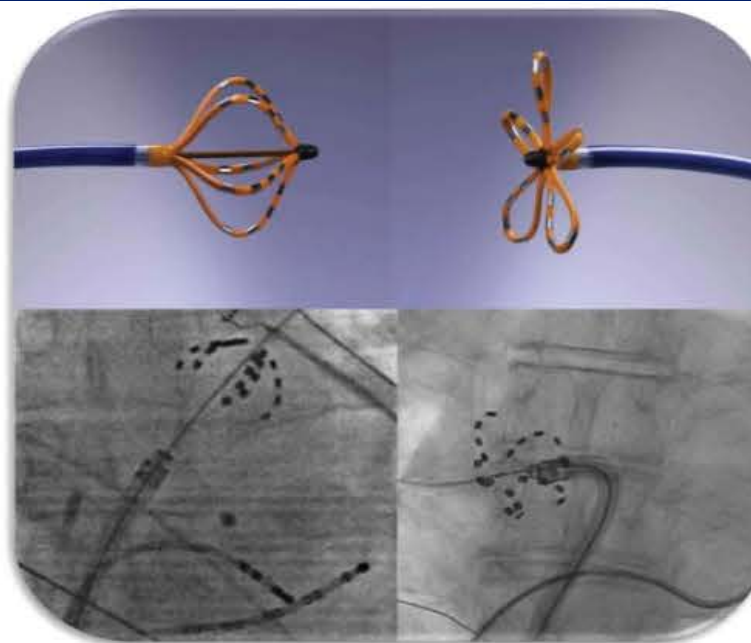
Real-World Outcomes of PFA for AF

24 centers in Europe

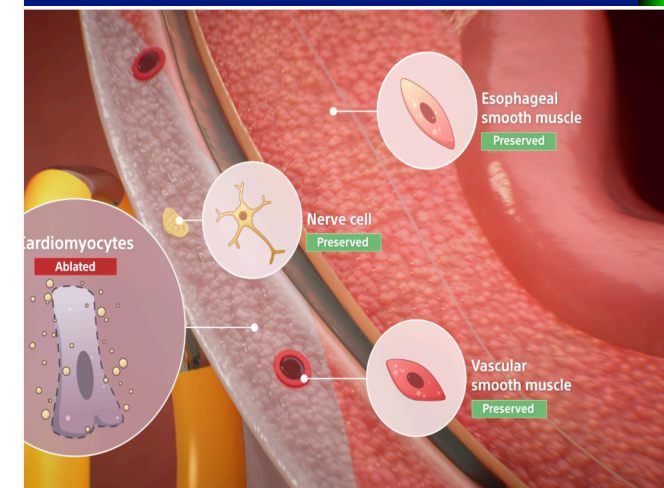
90 Operators

1,758 Patients

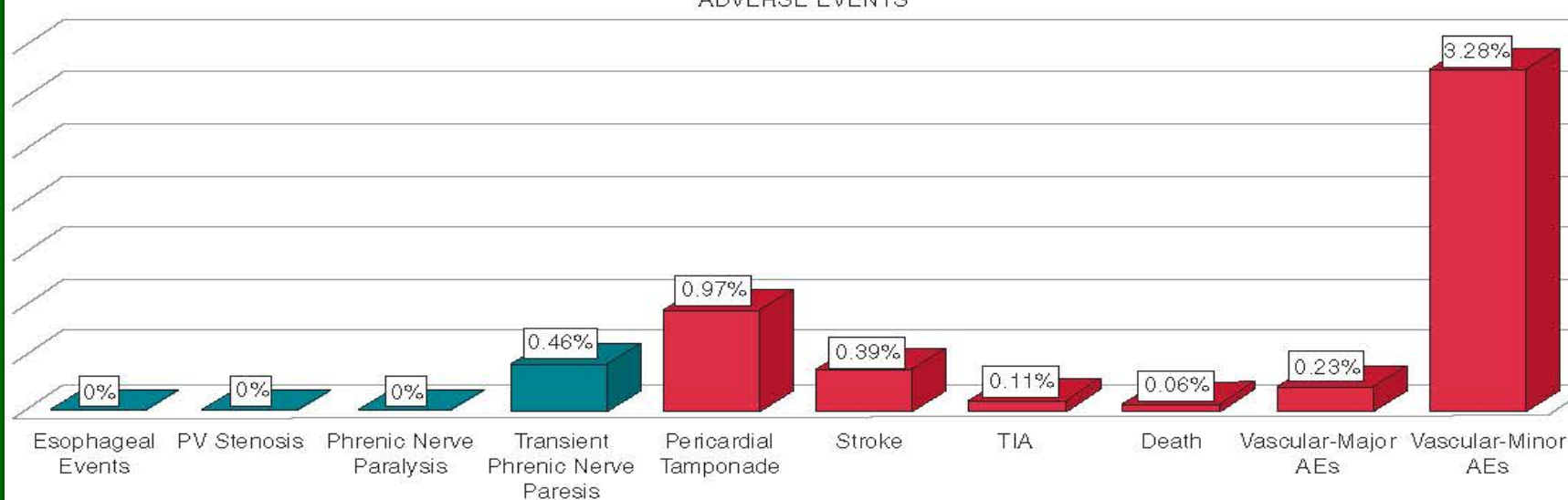
99.9% Acute PVI Success Rate



TISSUE SELECTIVITY



ADVERSE EVENTS



PFA-Specific AEs

Non-(PFA) Specific AEs

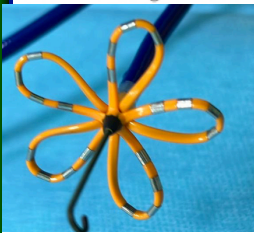
Boston Stock Trend



Safety and Effectiveness of Pulsed Field Ablation to Treat Atrial Fibrillation: One-Year Outcomes From the MANIFEST-PF Registry

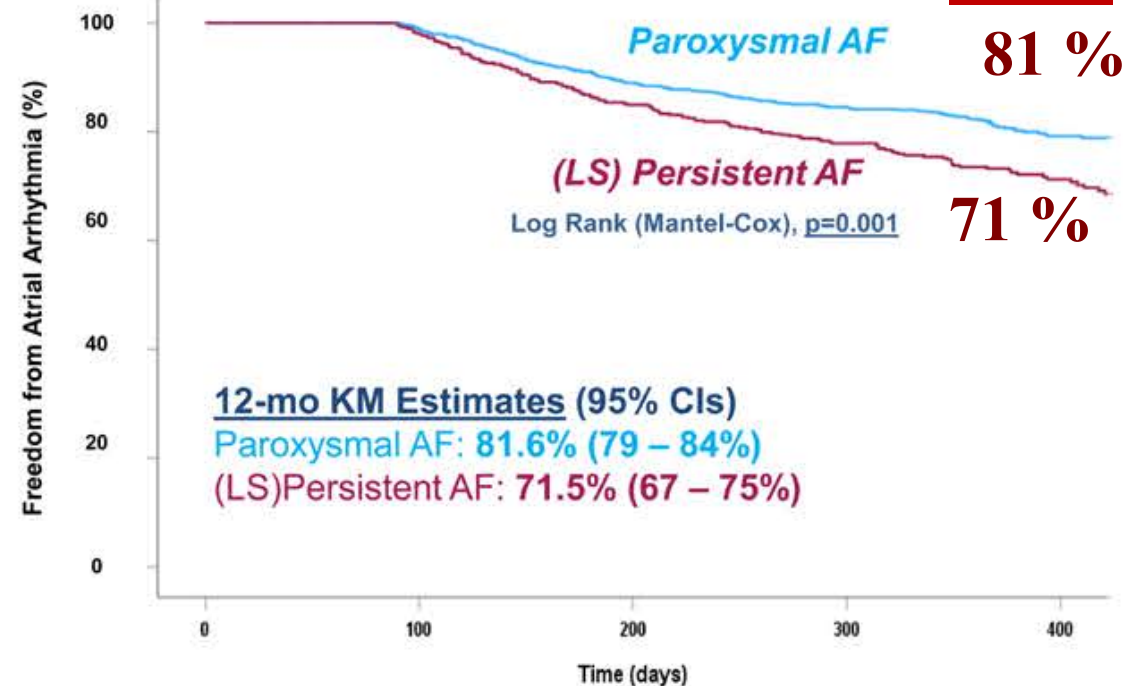
Mohit K. Turagam¹, MD; Petr Neuzil², MD PhD; Boris Schmidt³, MD; Tobias Reichlin⁴, MD; Kars Neven, MD;

Circulation. 2023;148



Very long-term outcome following transcatheter ablation of atrial fibrillation. Are results maintained after 10 years of follow up?

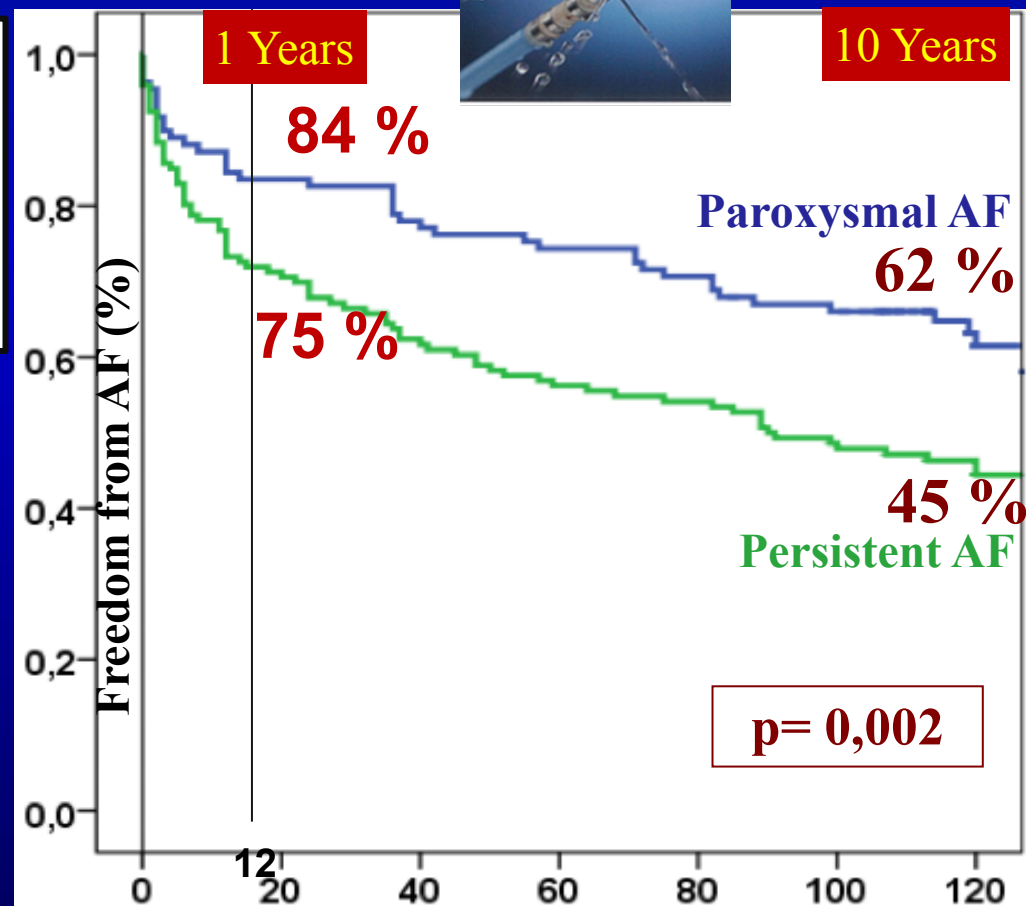
Fiorenzo Gaita^{1*}, Marco Scaglione², Alberto Battaglia¹, Mario Matta¹, Cristina Gallo¹, Michela Galatà¹, Domenico Caponi², Paolo Di Donna², and Matteo Anselmino¹
Europace 2018



No. of Patients	1,021	995	809	657	282
Paroxysmal AF					
Persistent AF	547	534	414	336	153

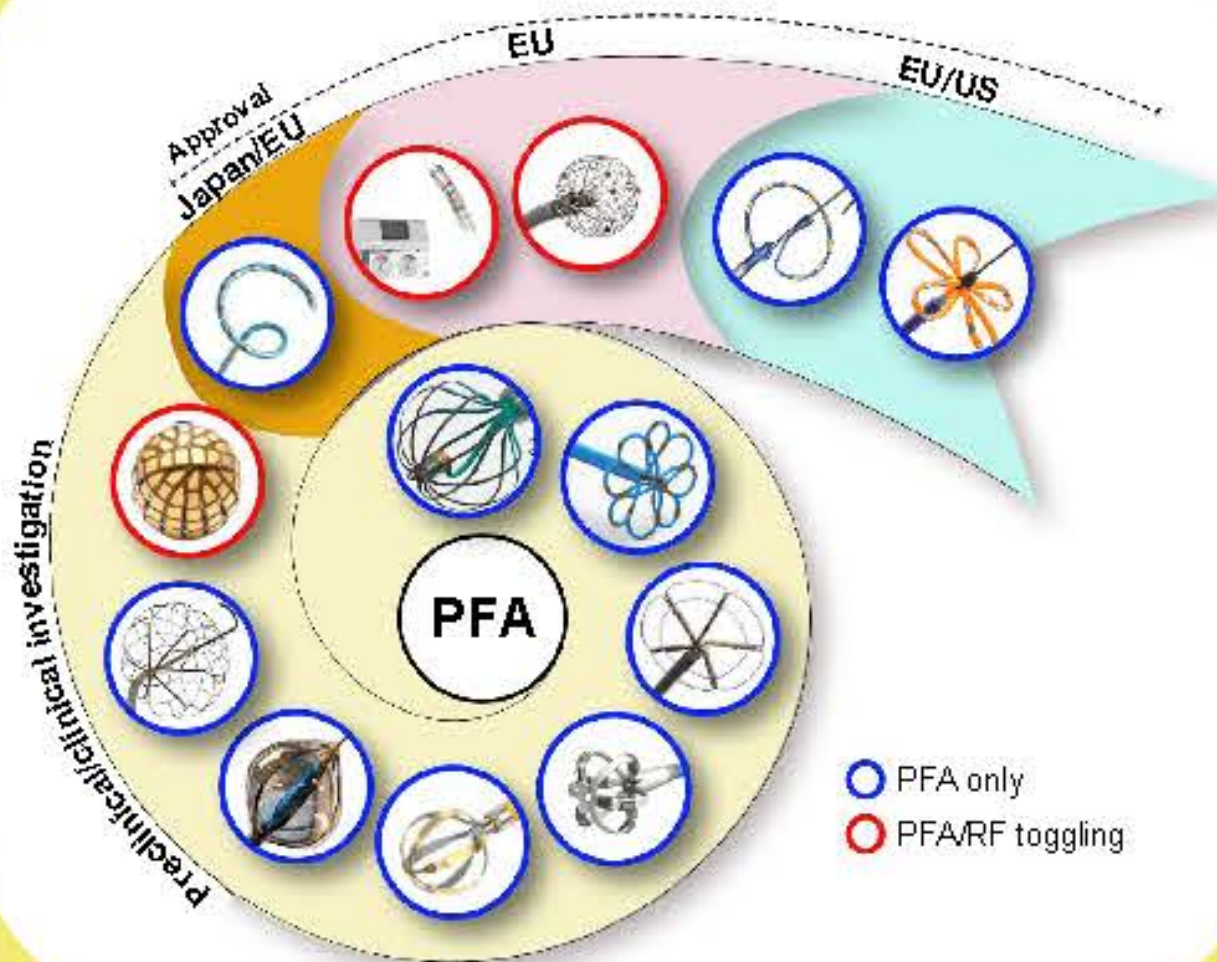
10
Years

?

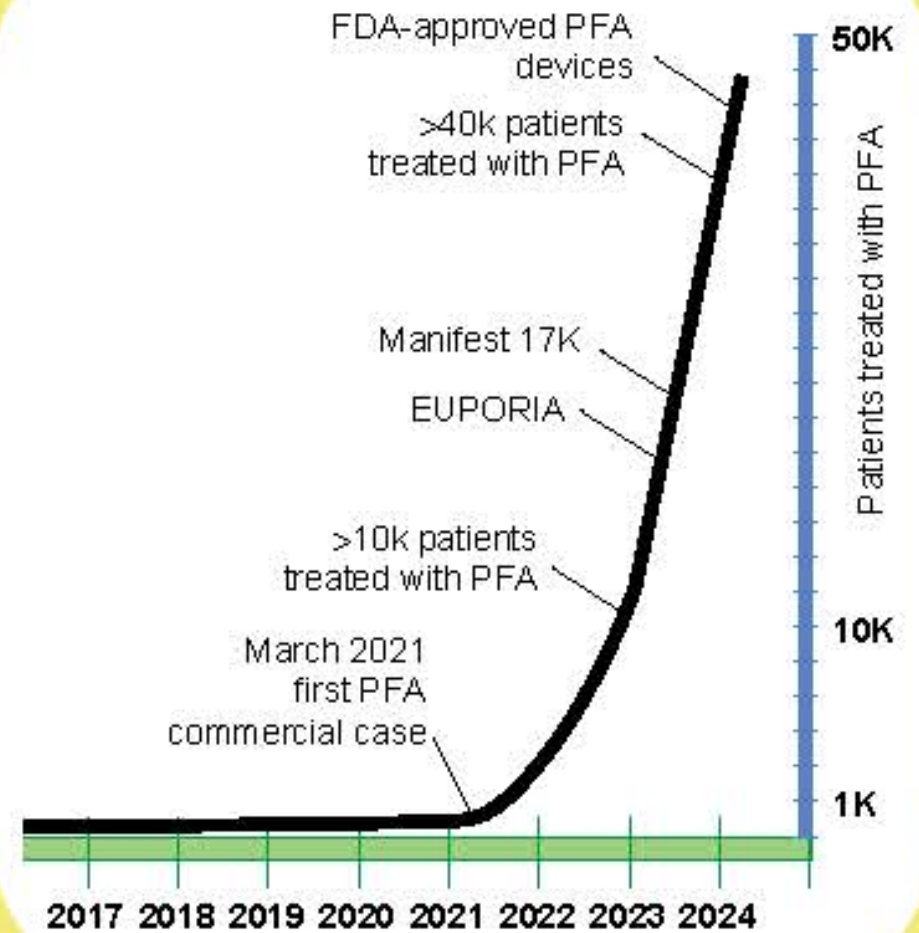


PFA Ablation

Devices



Clinical experience





2 CENTRI

2000



2001



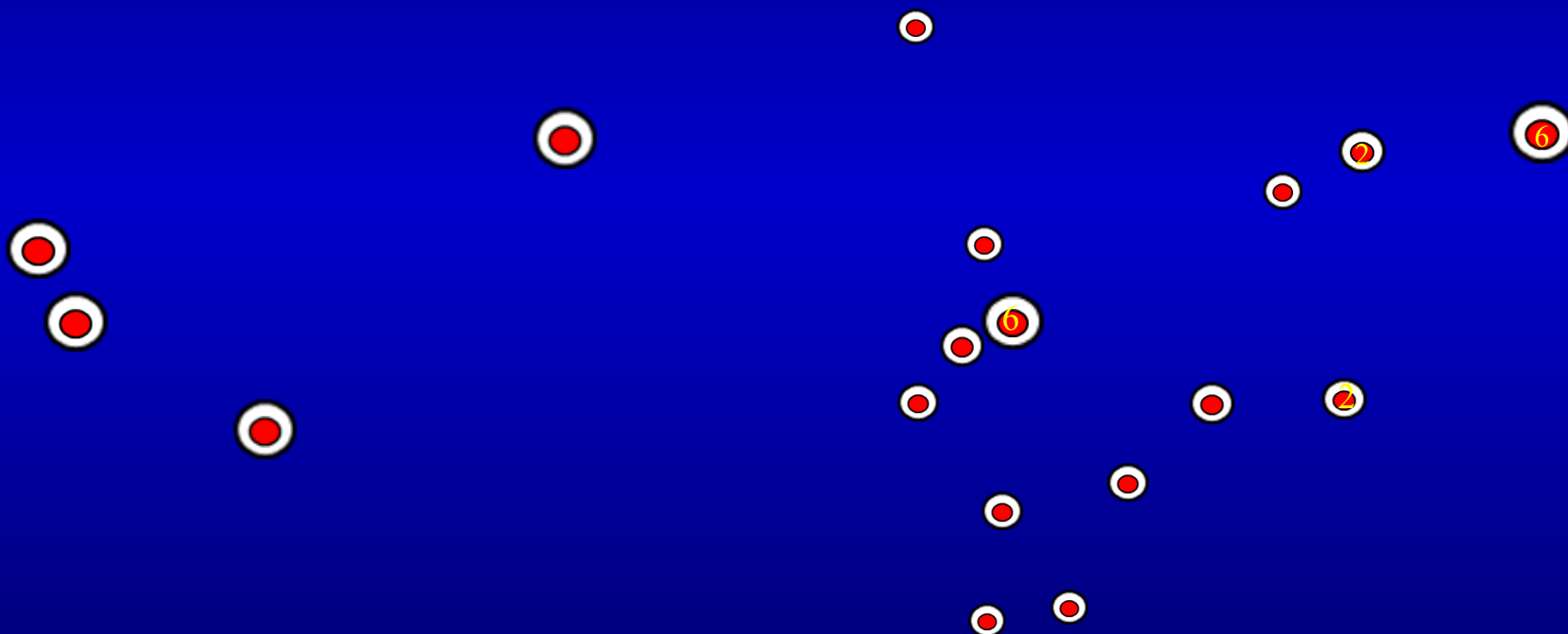
20 CENTRI

2026

Atrial
Fibrillation
Ablation
Centers

2026

Technological
evolution and the
advent of PFA
have
"democratized"
AF ablation



Conclusion

Patients with AF are an heterogeneous group characterized by different substrates, triggers and modulating factors

Pulmonary vein isolation alone is not enough to cure all patients with AF

Each patient should be given an individualized ablation strategy and not just the procedure we are able to perform.

Thanks for your attention!

