

# Ablation for AF: a technique with increasing success?

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# Schema

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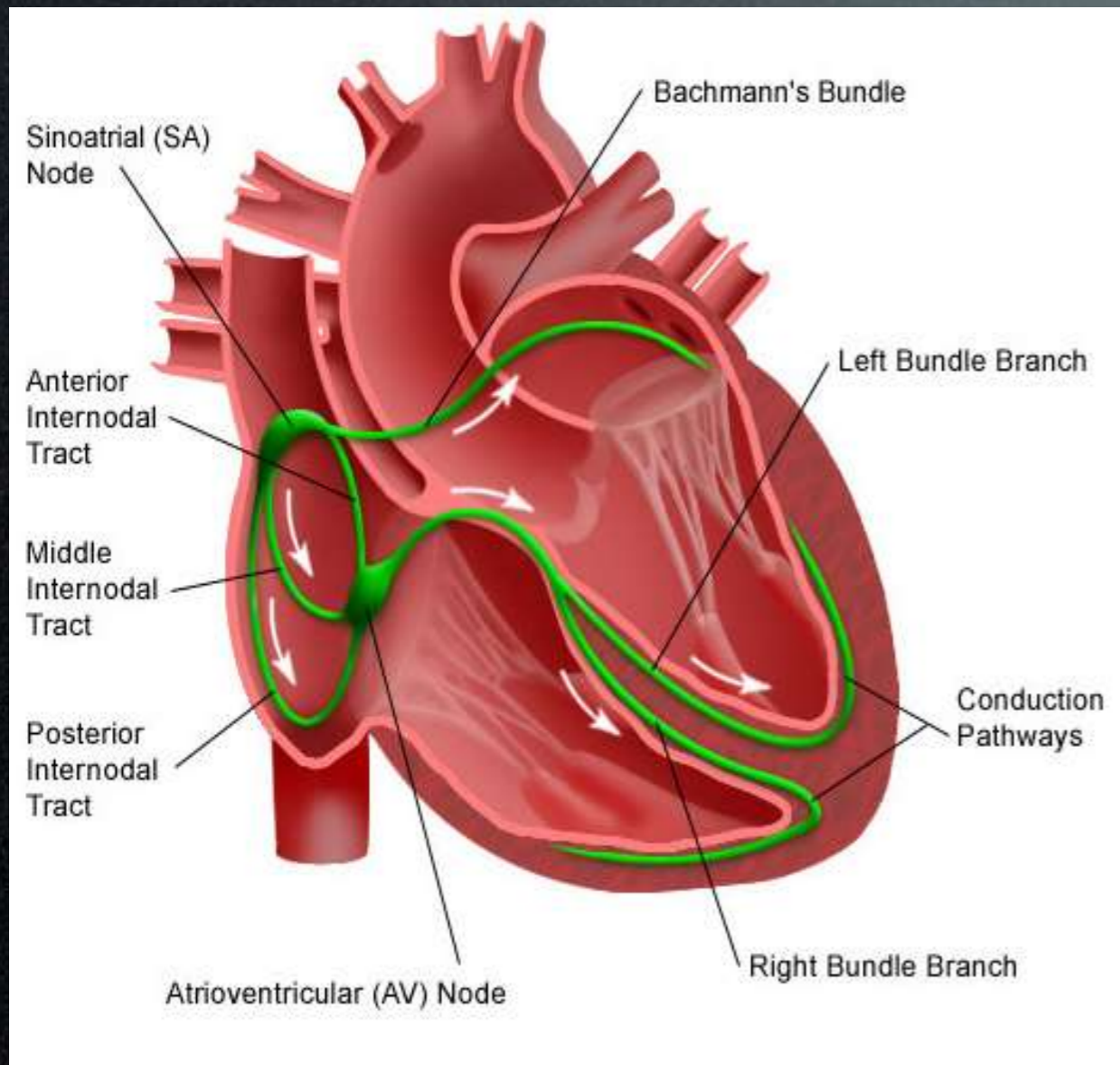
? **Why**: The Rate vs Rhythm debate

? **How**: Evolution of AF ablation

? **Who**: are we taking on

? **How good** :are the results

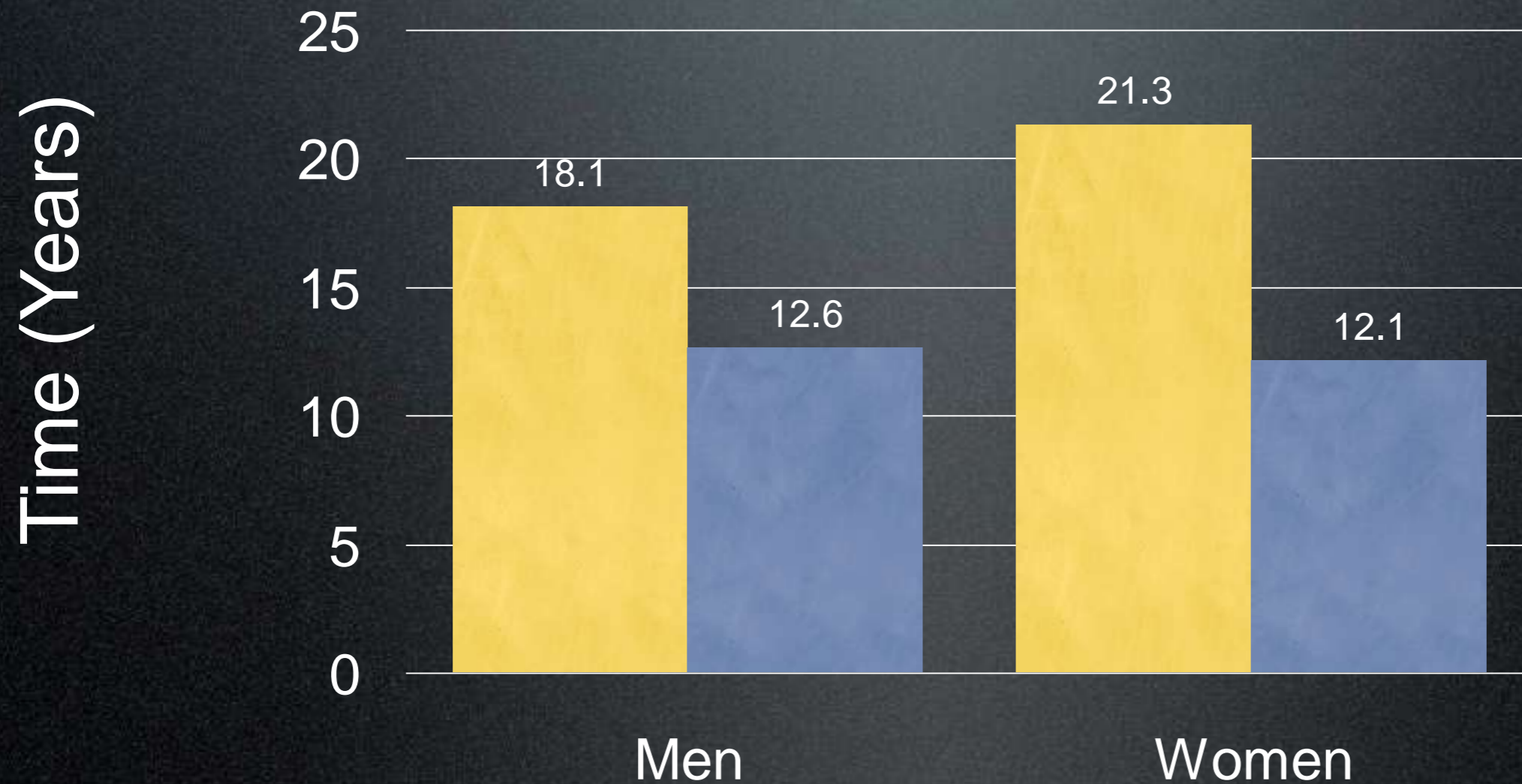
# Deleterious effects of AF



- Loss of atrial contractility
  - Decreases cardiac output by up to a third
- Predisposition to stroke
  - Increases risk 5-fold
  - Large strokes (twice as likely to be fatal)
- Tachycardiomyopathy

# Mean survival from diagnosis

Patients aged 55-64 at time of diagnosis



‘But isn’t Rate control as good as  
Rhythm control?’

# Issues with Rate vs Rhythm trials

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- Elderly population, minimally symptomatic
- Differences in anticoagulation rates
- Intention to treat design compromised Rhythm control
  - Anti-arrhythmic drugs
    - Limited efficacy: sinus maintenance rate 38-66%
    - Associated with  $\square$  mortality

# Relationships Between Sinus Rhythm, Treatment, and Survival in the Atrial Fibrillation Follow-Up Investigation of Rhythm Management (AFFIRM) Study

*Circulation. 2004;109:1509-1513.*

HR: 99% Confidence Limits

Covariate	<i>P</i>	HR	Lower	Upper
Age at enrollment*	<0.0001	1.06	1.05	1.08
Coronary artery disease	<0.0001	1.56	1.20	2.04
Congestive heart failure	<0.0001	1.57	1.18	2.09
Diabetes	<0.0001	1.56	1.17	2.07
Stroke or transient ischemic attack	<0.0001	1.70	1.24	2.33
Smoking	<0.0001	1.78	1.25	2.53
Left ventricular dysfunction	0.0065	1.36	1.02	1.81
Mitral regurgitation	0.0043	1.36	1.03	1.80
Sinus rhythm	<0.0001	0.53	0.39	0.72
Warfarin use	<0.0001	0.50	0.37	0.69
Digoxin use	0.0007	1.42	1.09	1.86
Rhythm-control drug use	0.0005	1.49	1.11	2.01

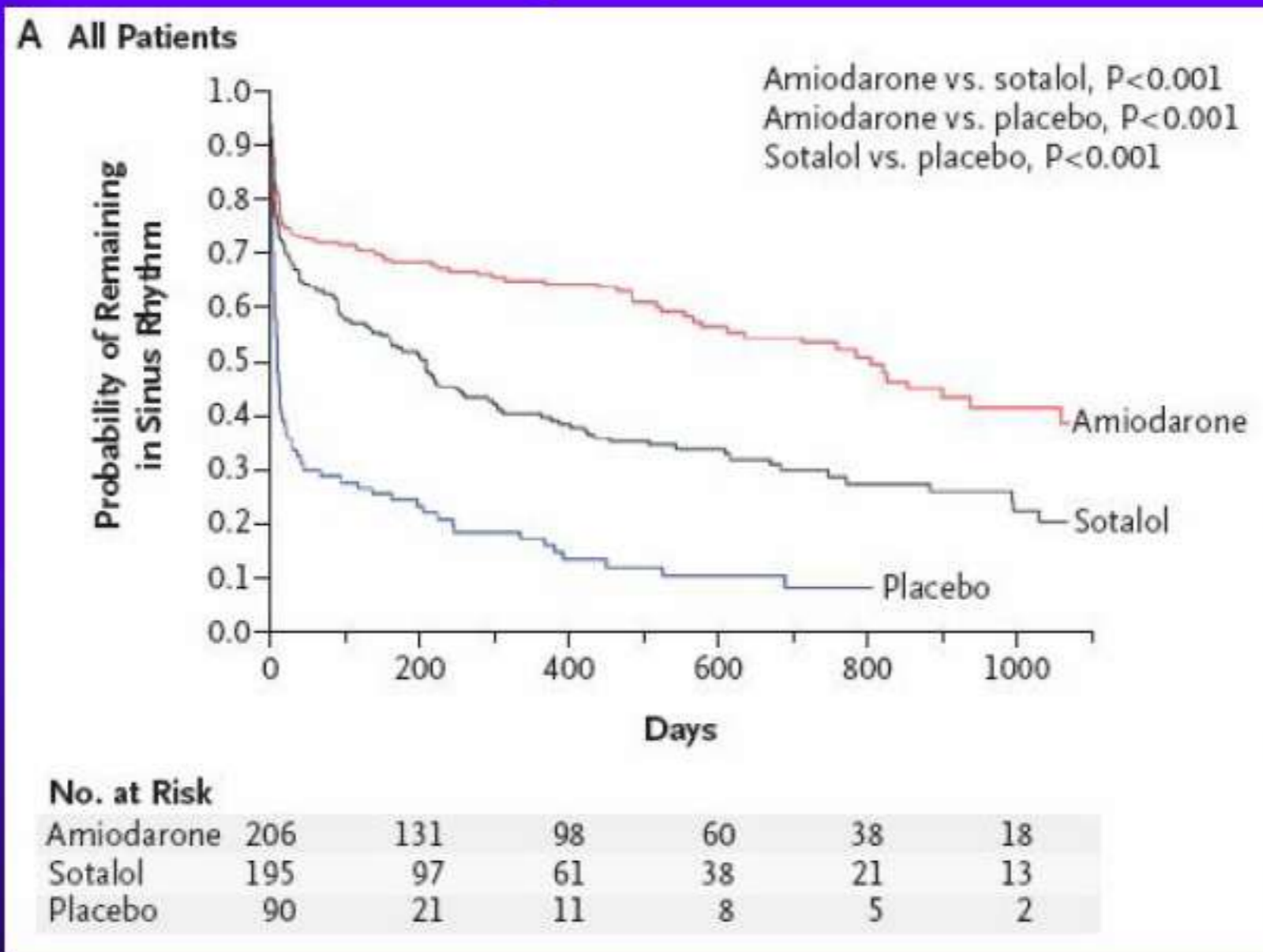


'If an effective method of maintaining SR with fewer AEs be available it might be beneficial'

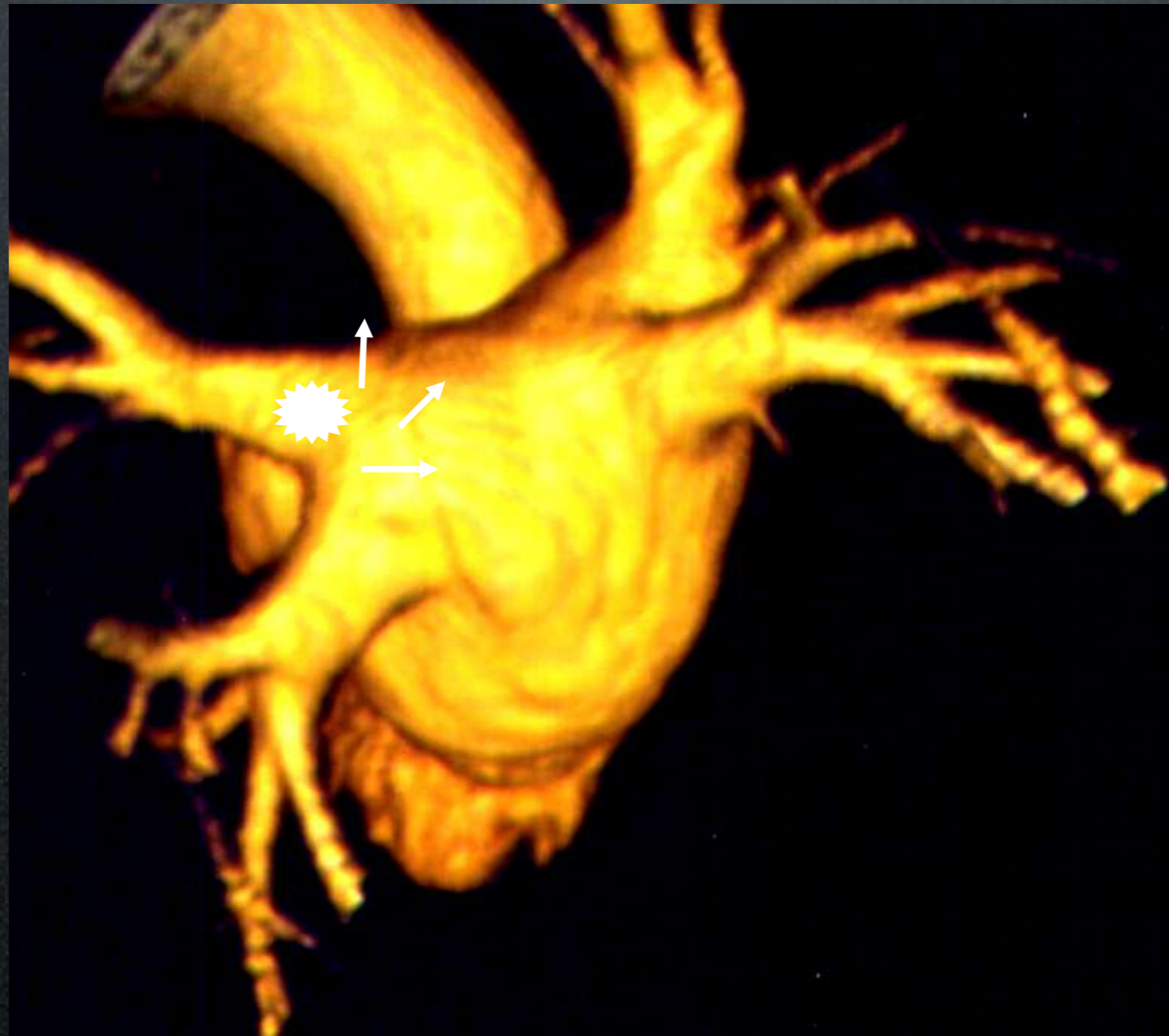
Atrial fibrillation is NOT the same as  
Sinus Rhythm

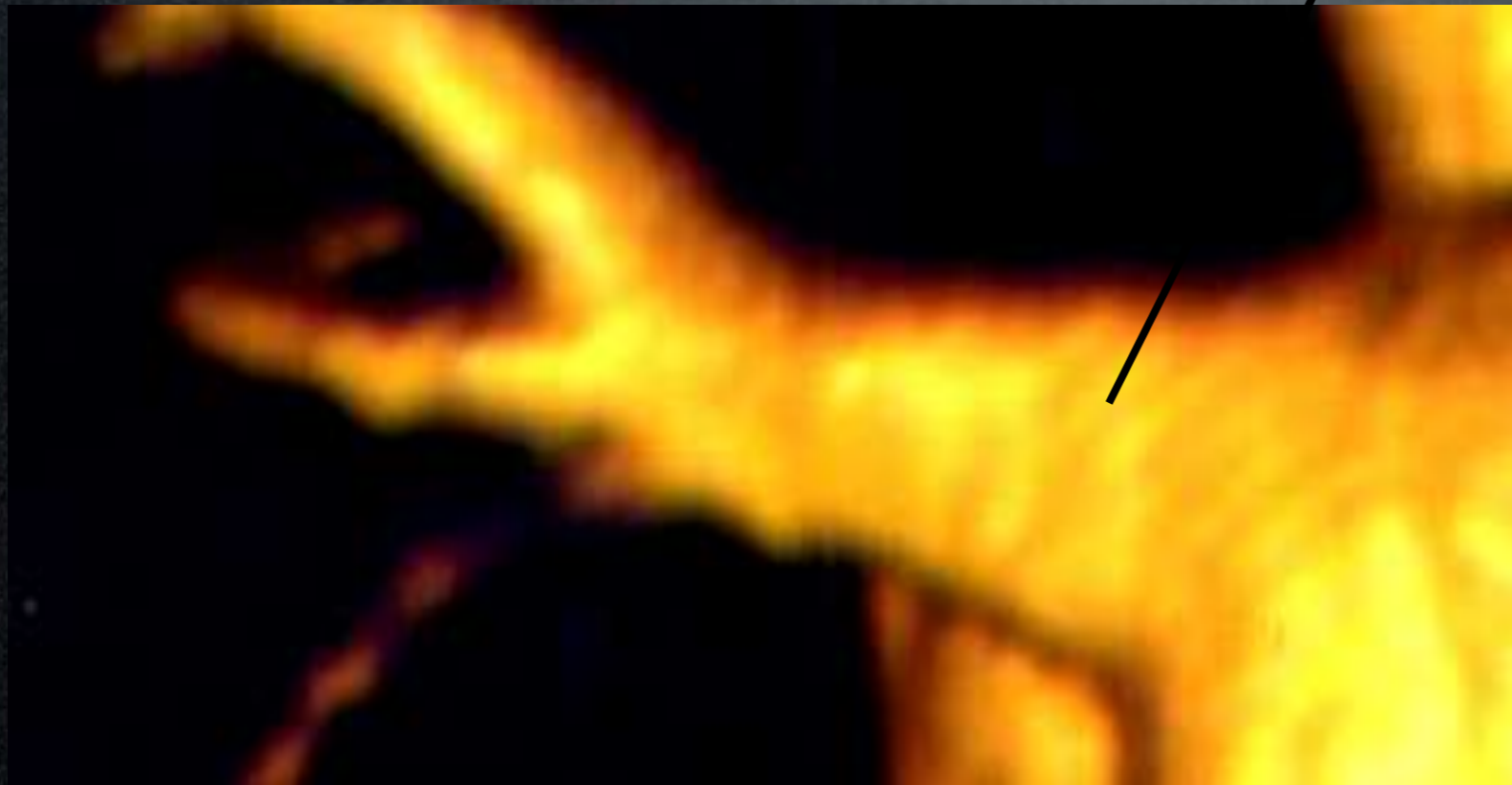
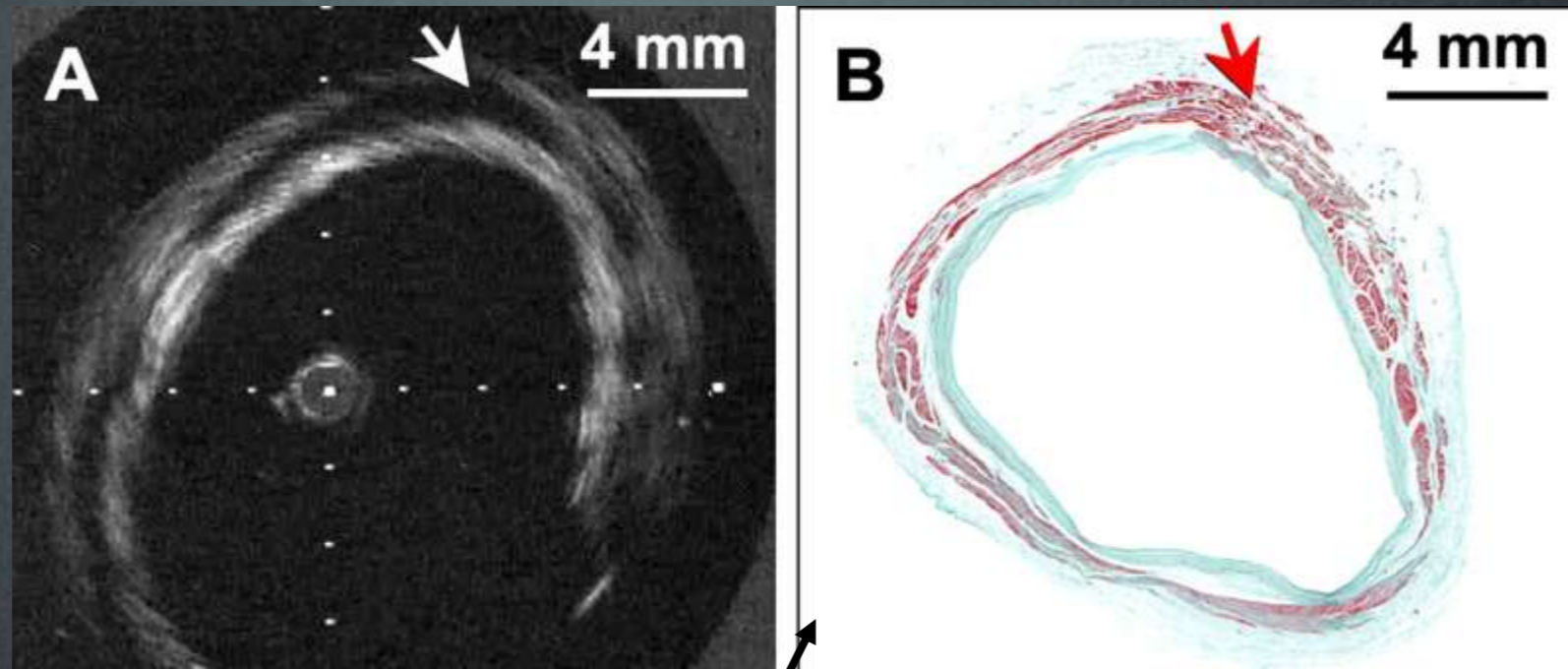
# Electrical cardioversion isn't a Cure

## AF Recurrences After DC Cardioversion SAFE Trial



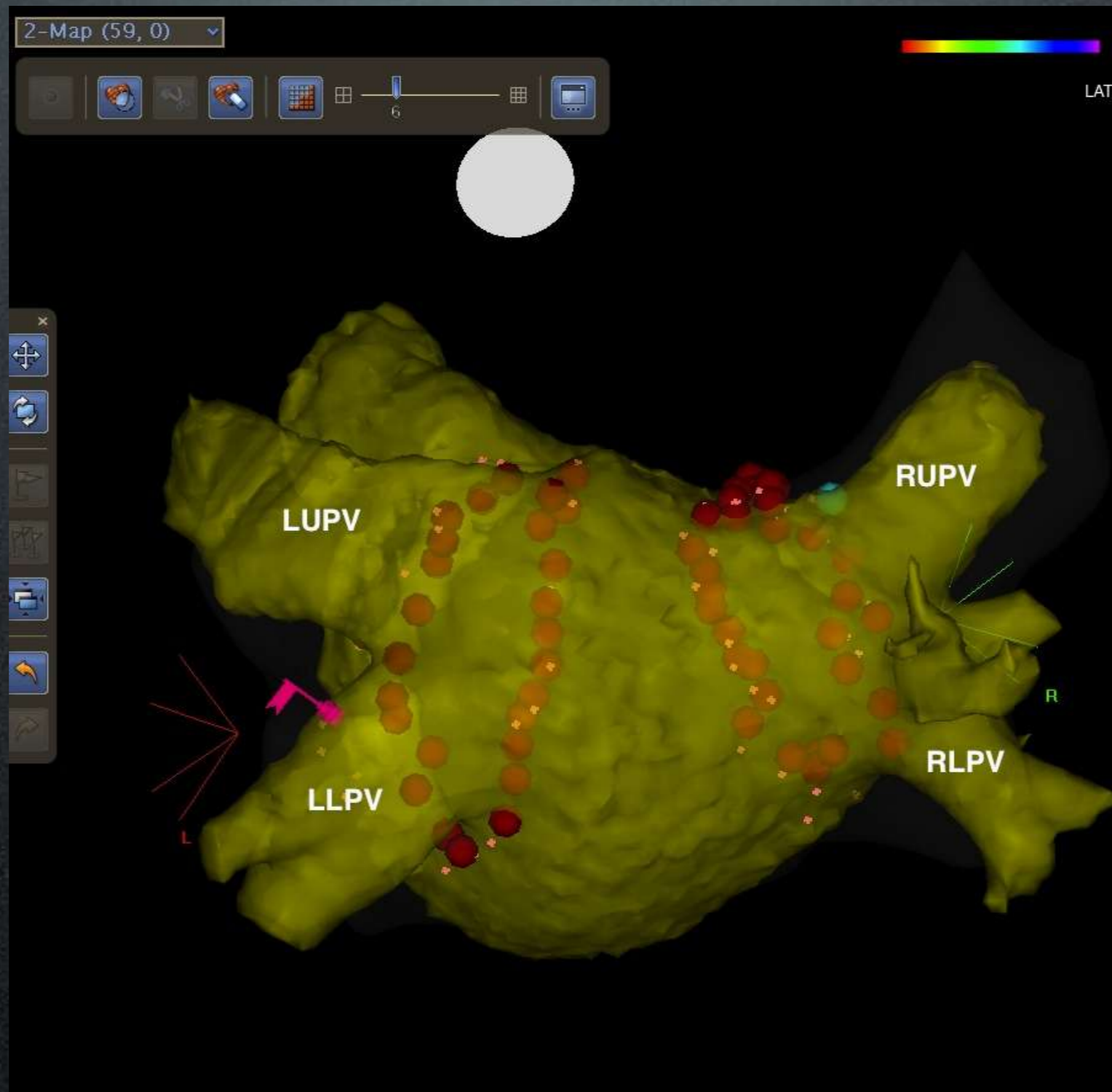
# Culprit for AF: Triggers in pulmonary veins





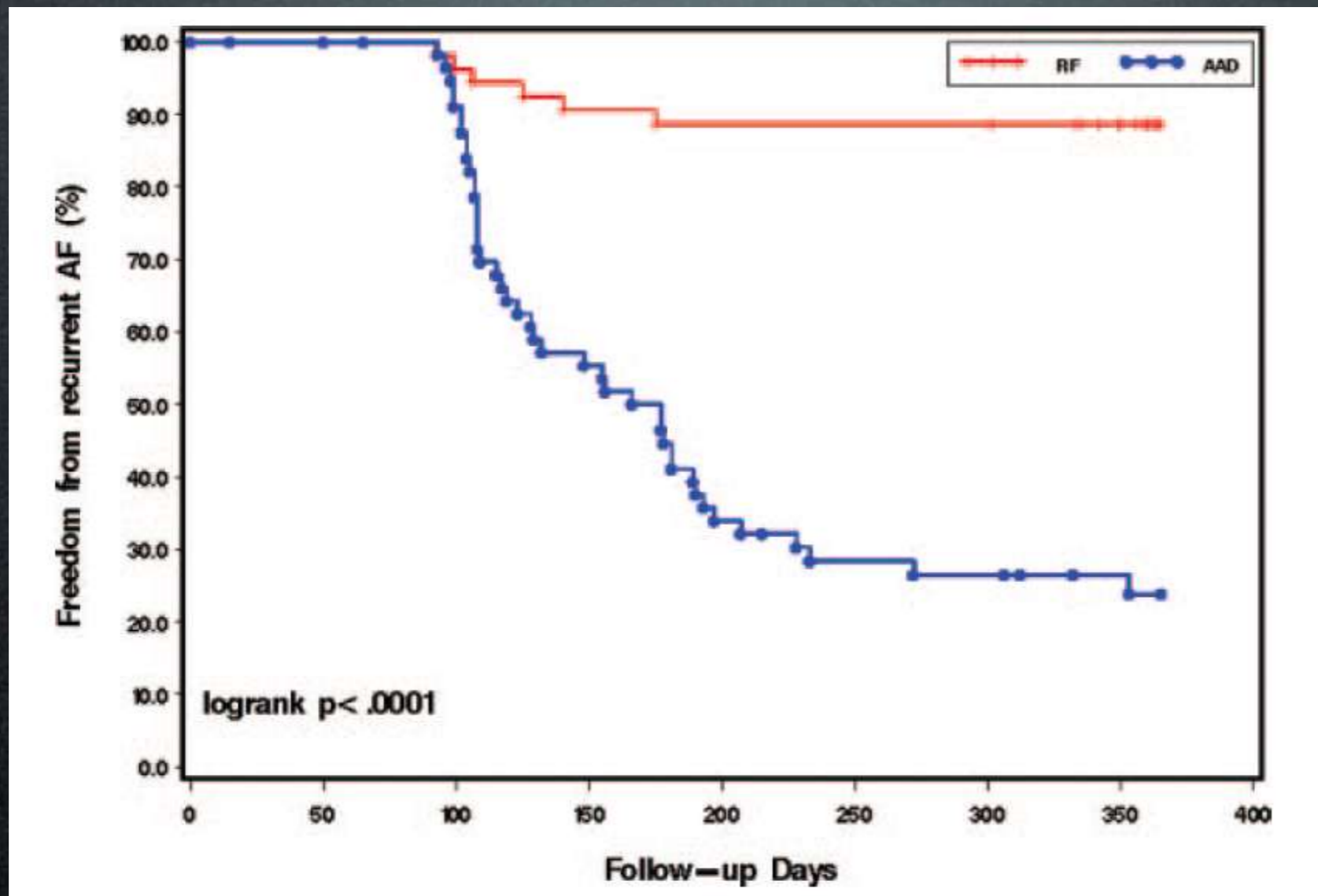
PV muscle sleeves contain specialised conduction tissue derived embryologically from the neural tube and destined to have spontaneous pacemaker activity

# Potentially curative treatment: Pulmonary Vein Isolation (PVI)





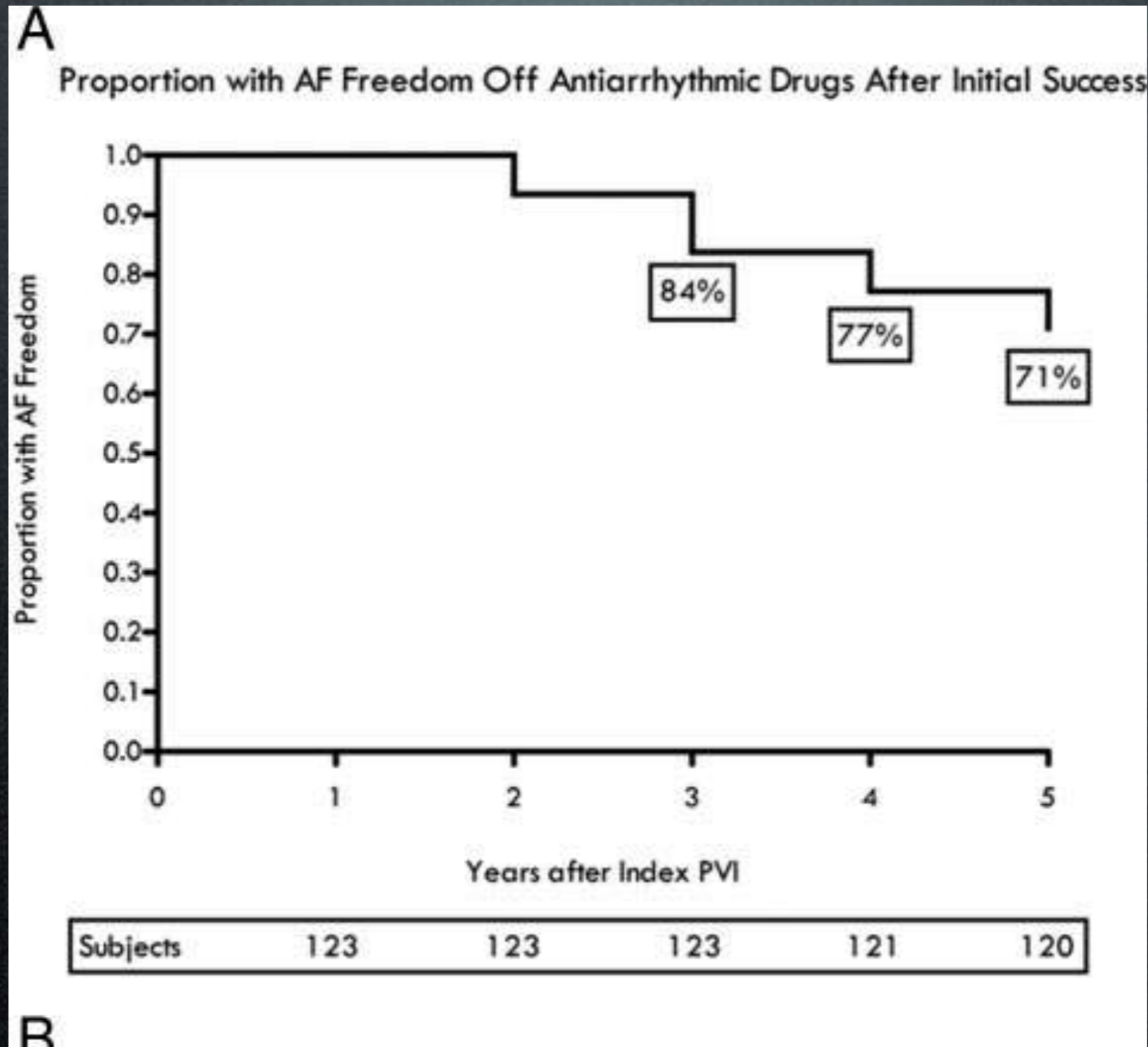
# Ablation better than drug therapy



## Catheter Ablation Versus Antiarrhythmic Drugs for Atrial Fibrillation

The A4 Study

# Long term outcome after AF ablation



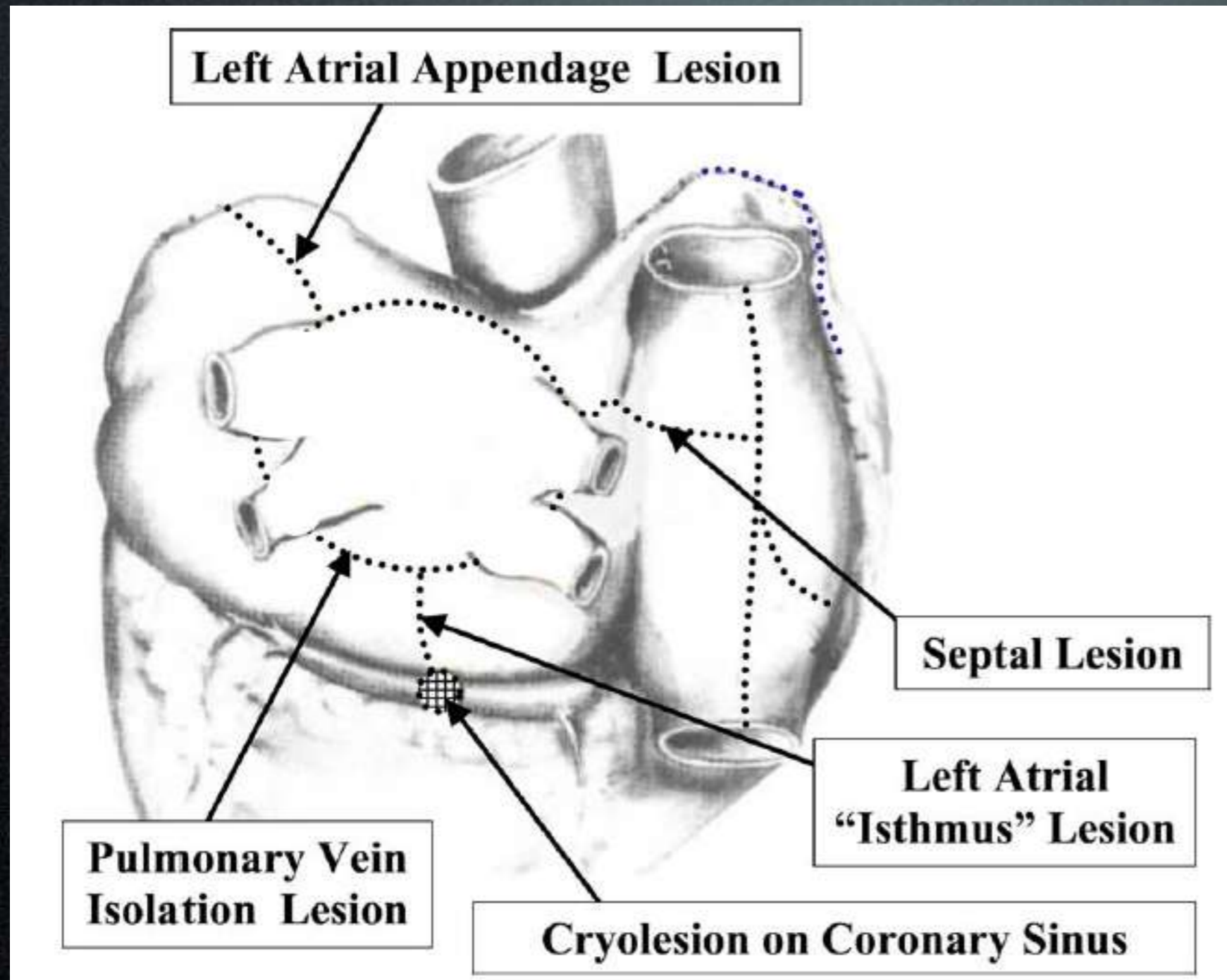
What about catheter ablation in Long standing Persistent AF?

# Long standing Persistent AF

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- Modest results with conventional PVI ablation
- Trigger removal alone not enough
- (Locking the stable door after the horse has bolted!)
- Widespread AF rotors in both atria
- Substrate modification is needed
- 'Atrial debulking'

# Surgical Maze Op for Persistent AF



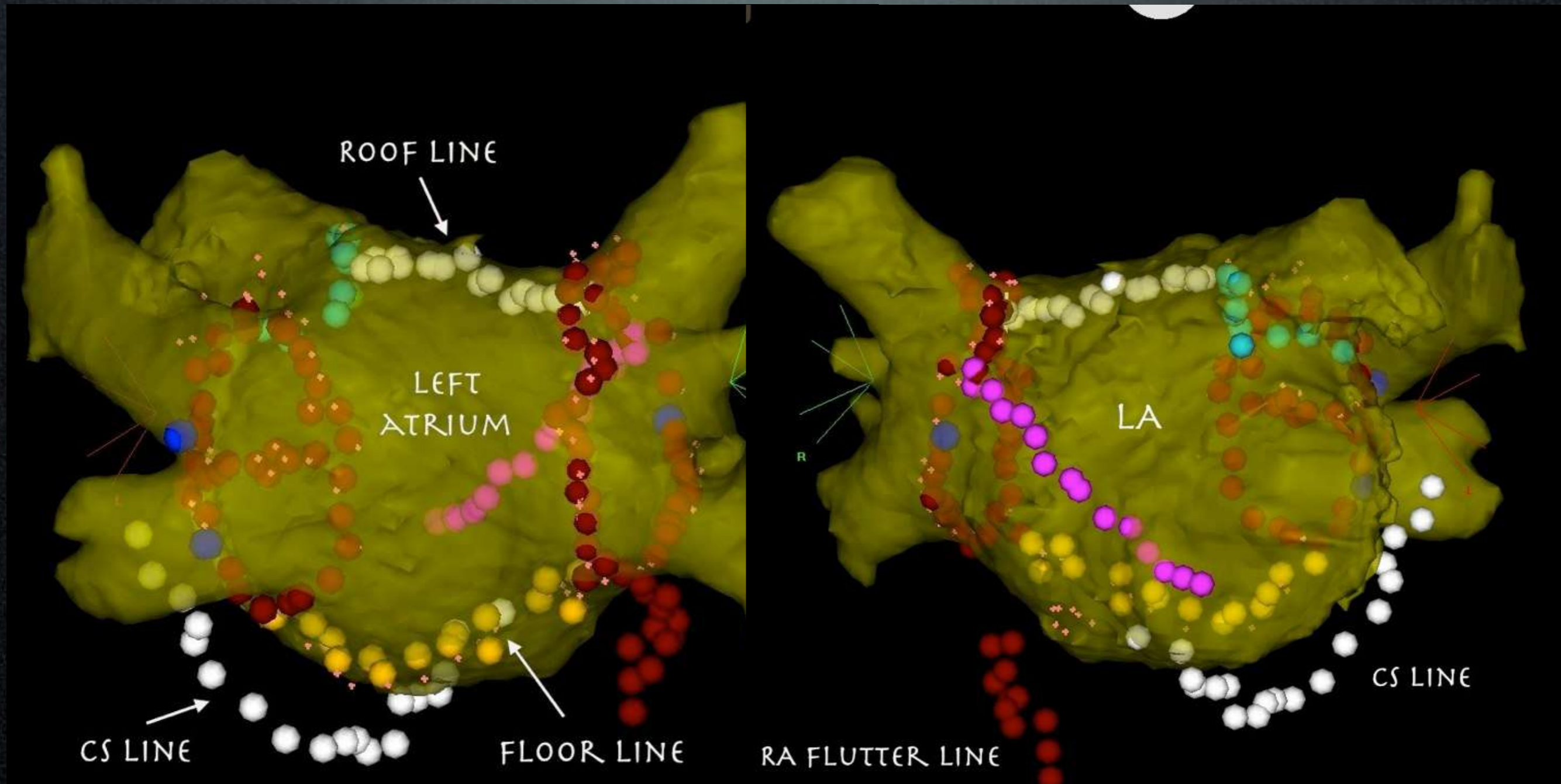
- Described by James Cox 1987

- Still the Gold standard in terms of results

- 96% free of AF at 5 years\*

\* SM Prasad et al, J Thorac Cardiovasc Surg 2003; 126: 1822-27

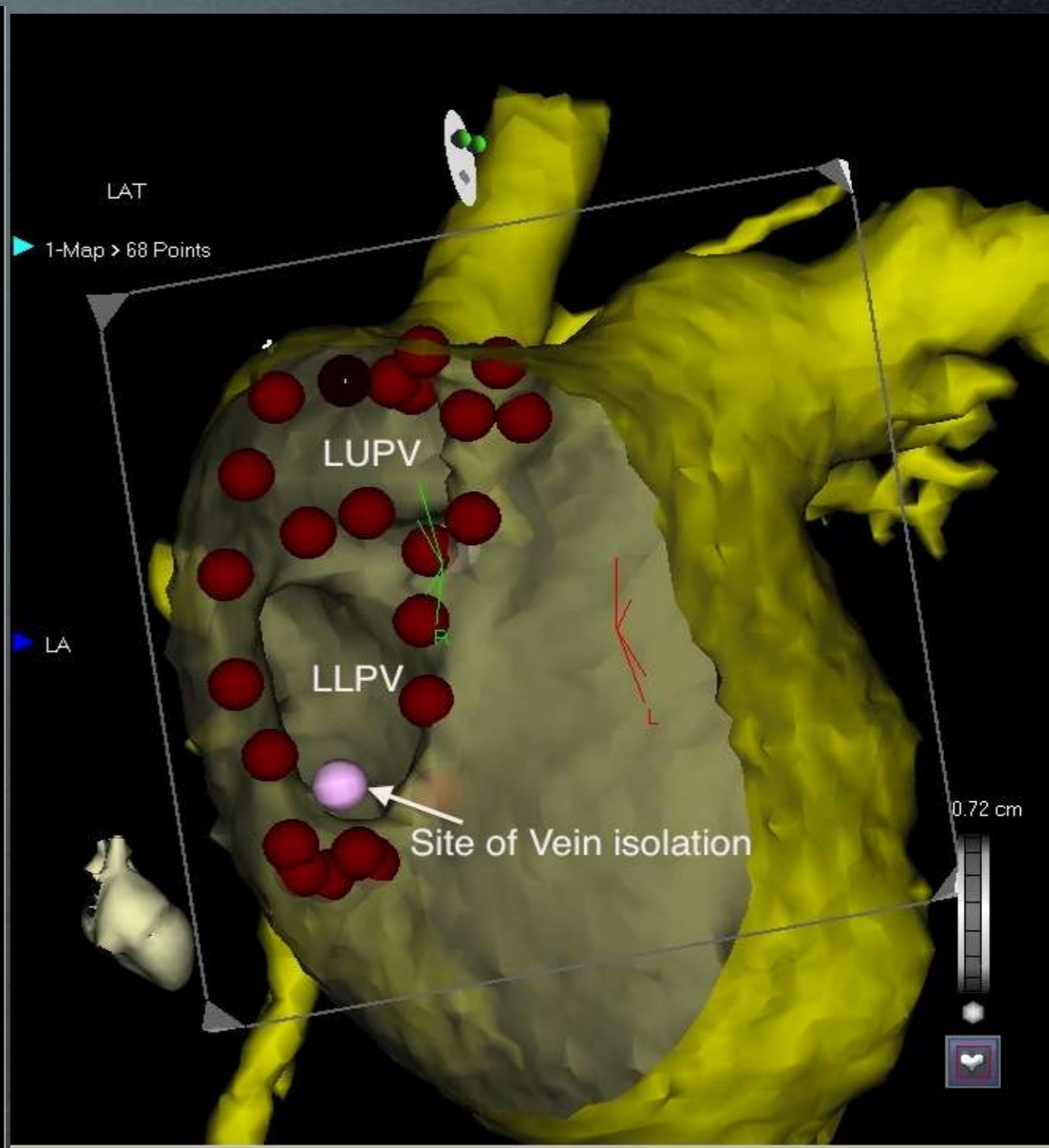
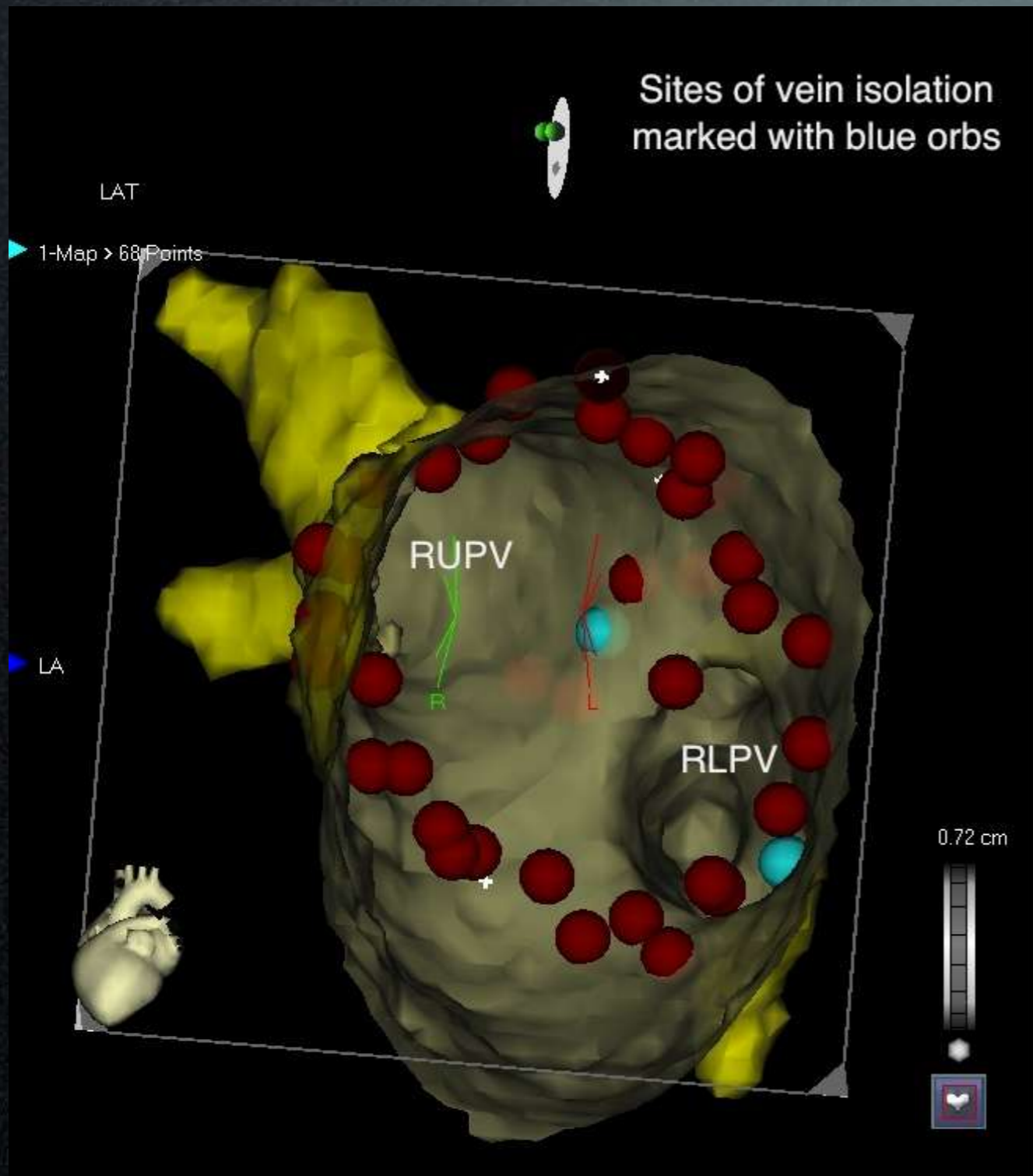
# Catheter Maze



# Results with Catheter Maze

	<b>N</b>	<b>Redo</b>	<b>AAD therapy</b>	<b>Results</b>	<b>Complications</b>
Haissaguerre JCE 2005	60	1/2	Stopped at ablation	<b>95% at 11 months</b>	2 Tamponades
Oral NEJM 2006	77	1/3	Amio 6/52 pre & 3/12 post	<b>77% at 1 year</b>	0
Postch Circ 2008	88	1/2	Stopped at ablation	<b>81% at 20 months</b>	2 Tamponades 1 TIA
Lo JCE 2009	87	1/4	AAD for 2/12 post	<b>79% at 21 months</b>	1 Tamponade

# 3D mapping has revolutionised procedure



# Influence of 3D mapping

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- Success rates have improved
  - Paroxysmal AF: 50-60% to 80-90%
  - Persistent AF: 30-40% to 70-80%
- Procedure times have decreased
  - From 4-5 hours to 2-3 hours
- Complication rates have come down
  - 3-4% to 1-2%

# Complications

- Procedural complications: 2-3%
  - Groin hematoma 1-2%
  - Tamponade 1%
  - PV stenosis <0.5%
  - Stroke 0.5%
  - Esophageal fistula 1 in 5,000
  - Mortality 0.1%
- Need for re-do procedures
  - Paroxysmal AF: 1 in 4
  - Persistent AF: 1 in 2

# Who is an ideal candidate for AF ablation?

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- Symptoms++
- Early stage of the disease
  - Paroxysmal AF
  - Recently persistent AF
- Structurally normal heart
- No major comorbidities

# Who may not be suitable?

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- Late stage of the disease
  - Very long standing Persistent AF (>2-3years)
  - Very large Left atrium (> 5.5 cm)
- Significant structural heart disease
  - Prosthetic mitral valve
  - Severe Mitral valve disease
- Major non cardiac co-morbidity
- Where the only reason is to come off Warfarin

# Recent successful cases at LHCH

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- 70/F with prosthetic *aortic* valve replacement
- 62/F with surgical closure of Atrial septal defect
- 69/F with device closure of Atrial septal defect
- 46/M with severe heart failure, BiV pacemaker
- 15/M with Persistent AF and tachy-myopathy

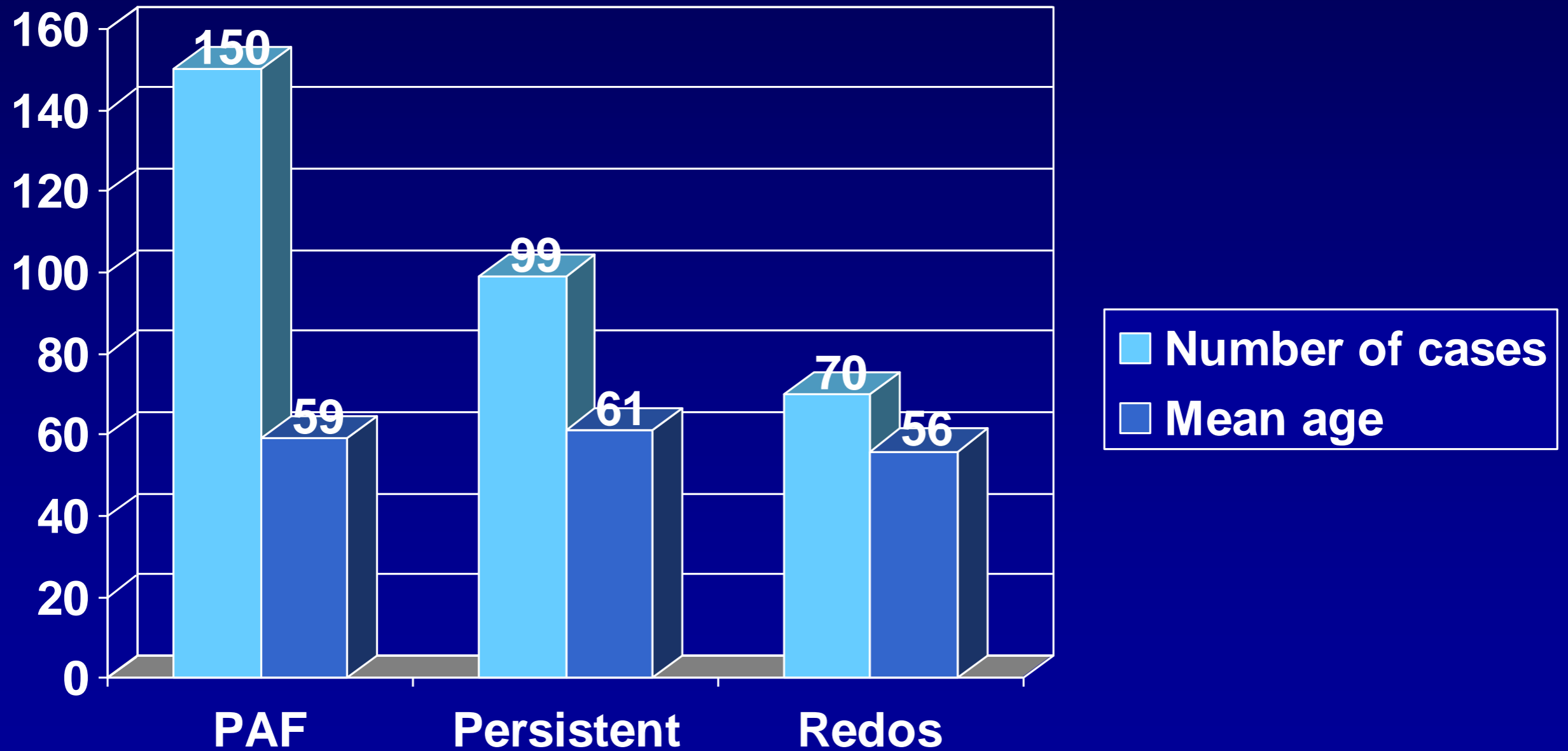
Your local service provision  
at  
Liverpool Heart and Chest Hospital

2 dedicated EP catheter laboratories

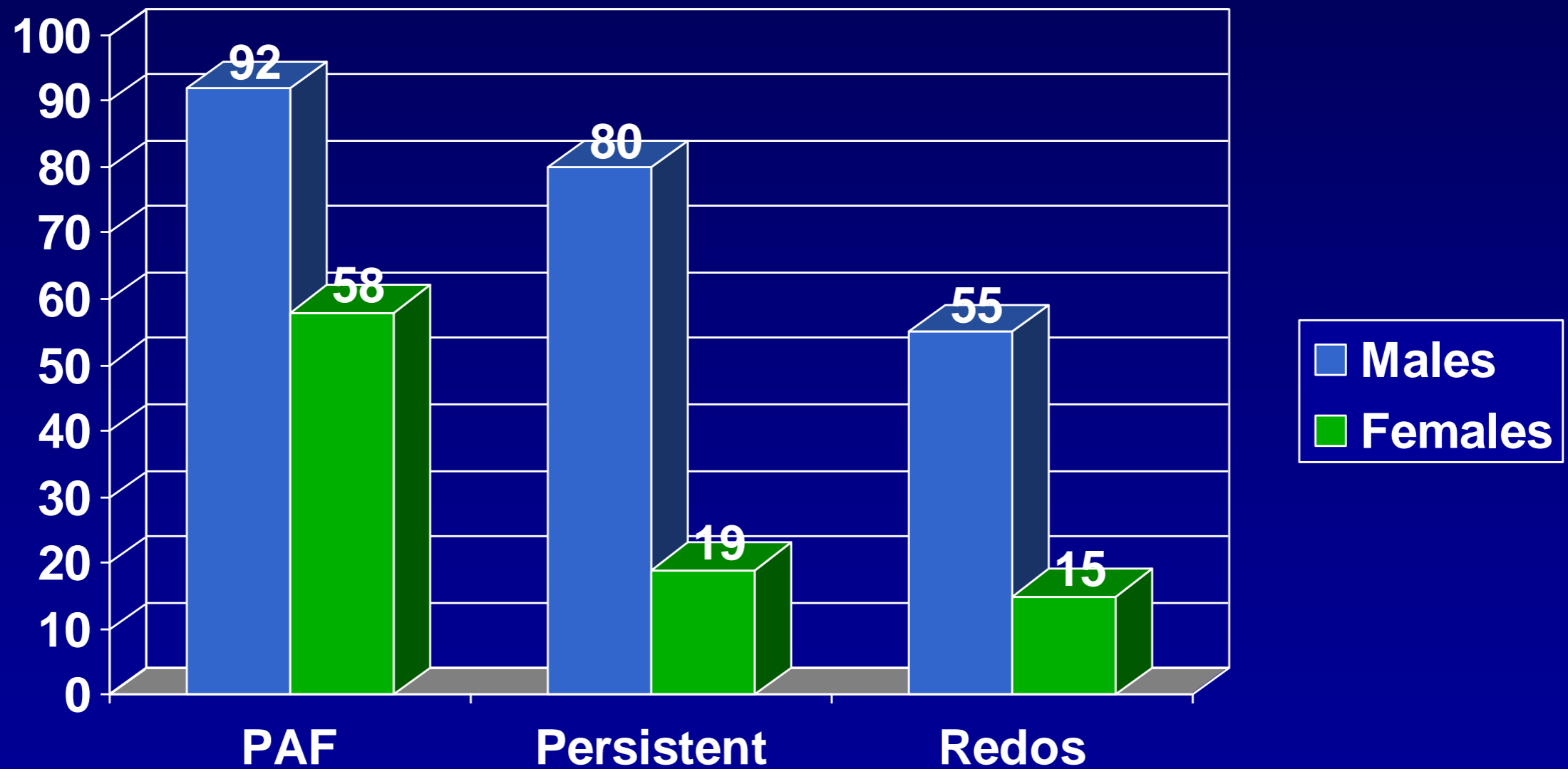
6 EP consultants

1100 EP cases in 2010/11

# AF ablations 2009/10

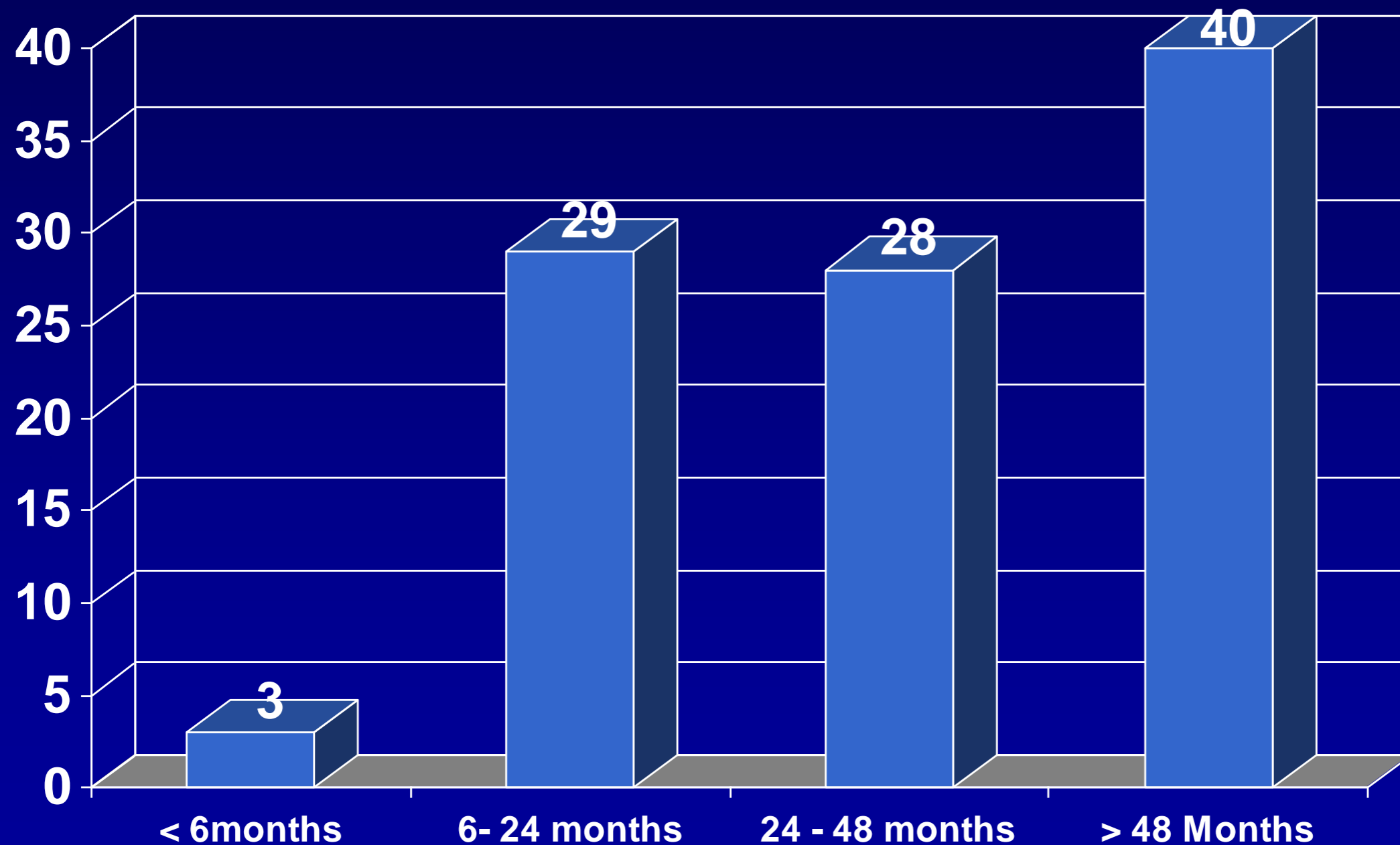


# By gender



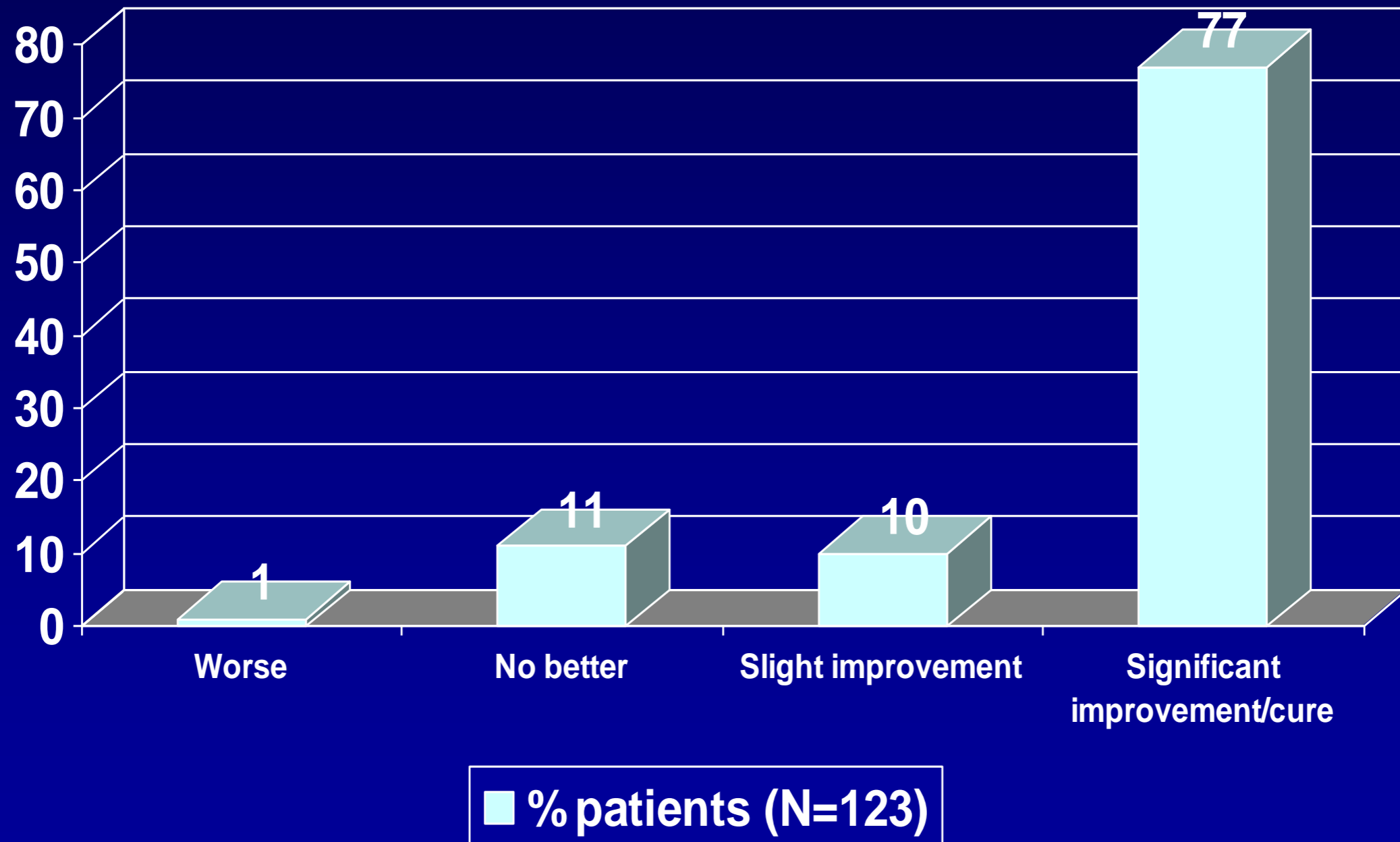
# Duration of symptoms pre ablation (%)

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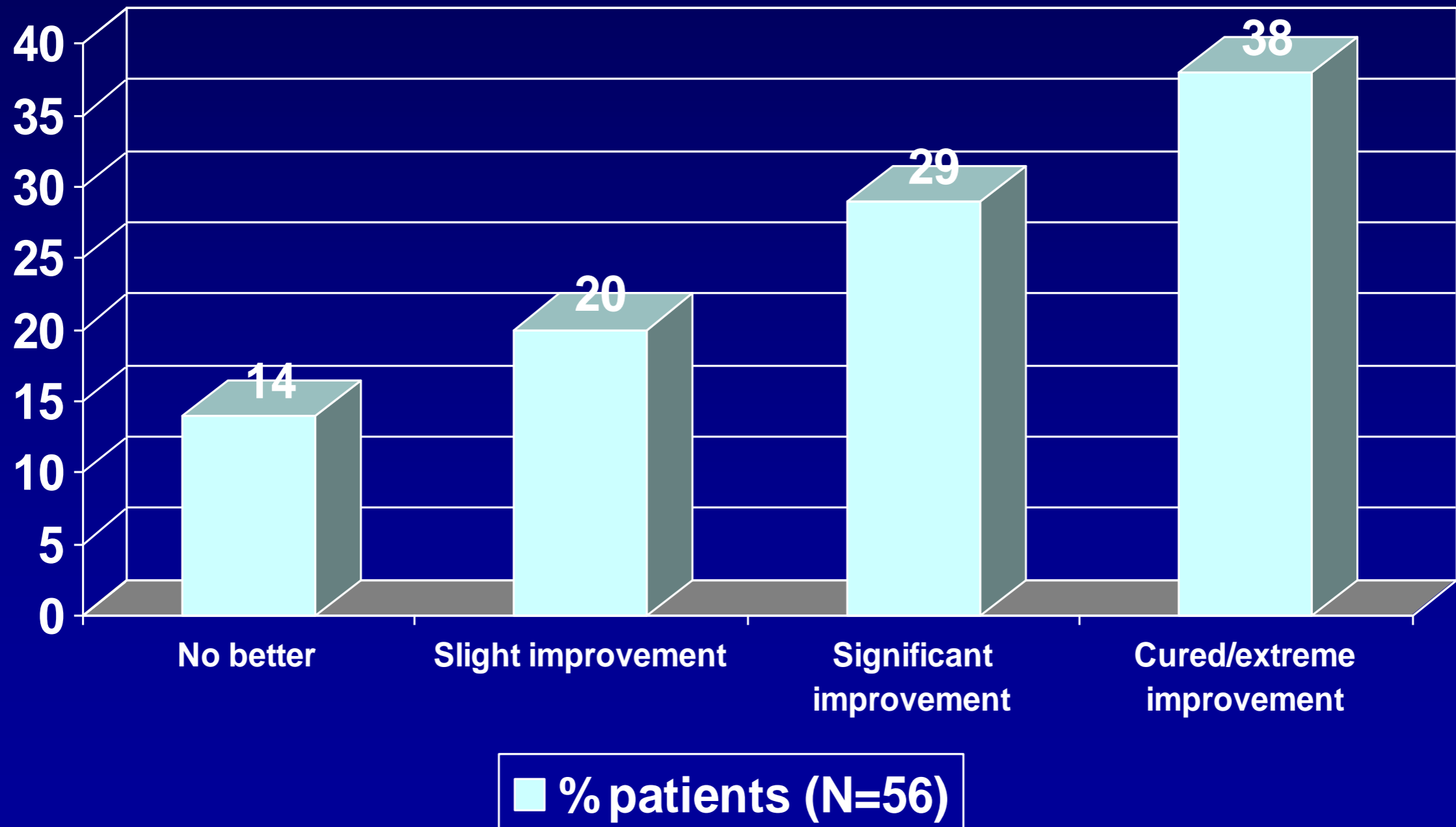
# Clinical improvement at 3/12 (%)

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# Clinical improvement at 1 year (%)

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# Complications

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- 2 groin haematomas
- 1 stroke
- 2 Pericardial effusions requiring drainage
- No death

# Conclusions

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- AF is NOT the same as sinus rhythm
- Curative AF ablation now an option for increasing number of patients
- Early and appropriate referral is key