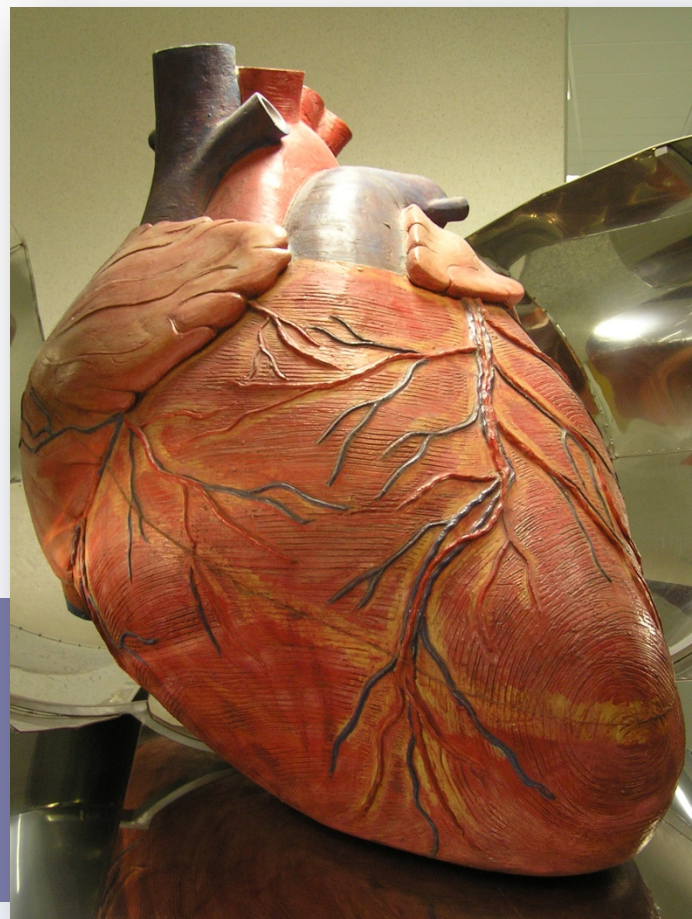
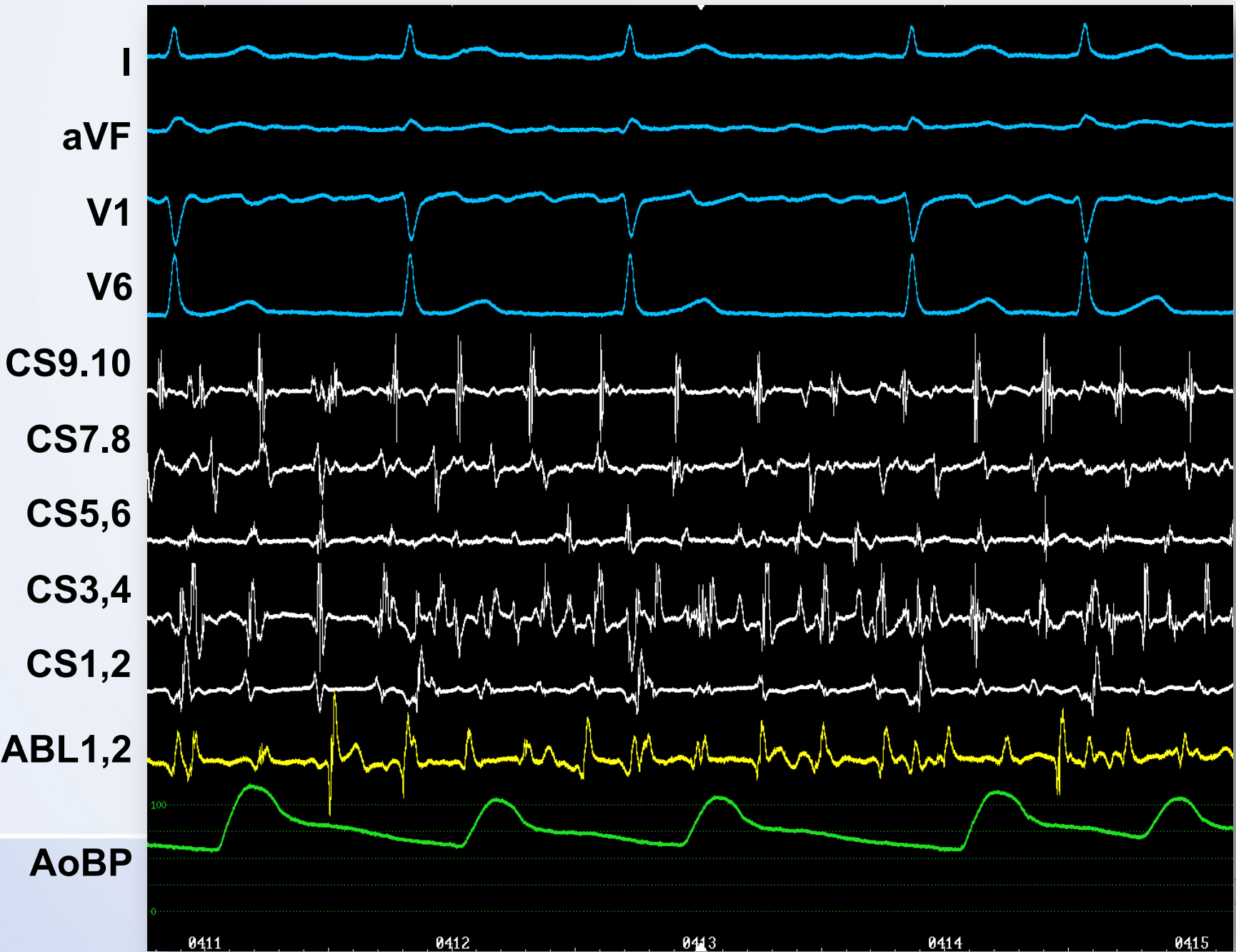


Fibrilace síní není benigní srdeční arytmii

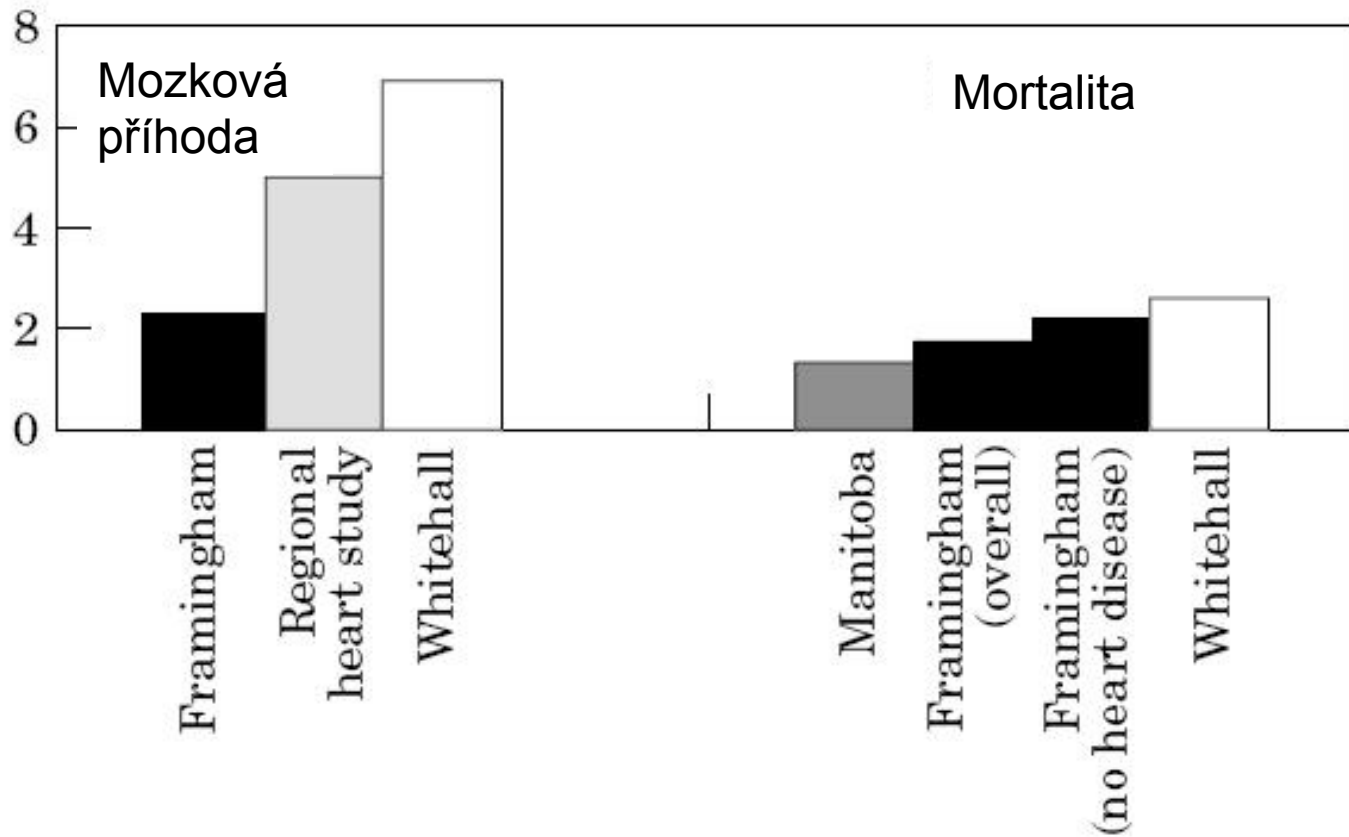
Prof MUDr Josef Kautzner, CSc

Klinika kardiologie, IKEM,
Praha

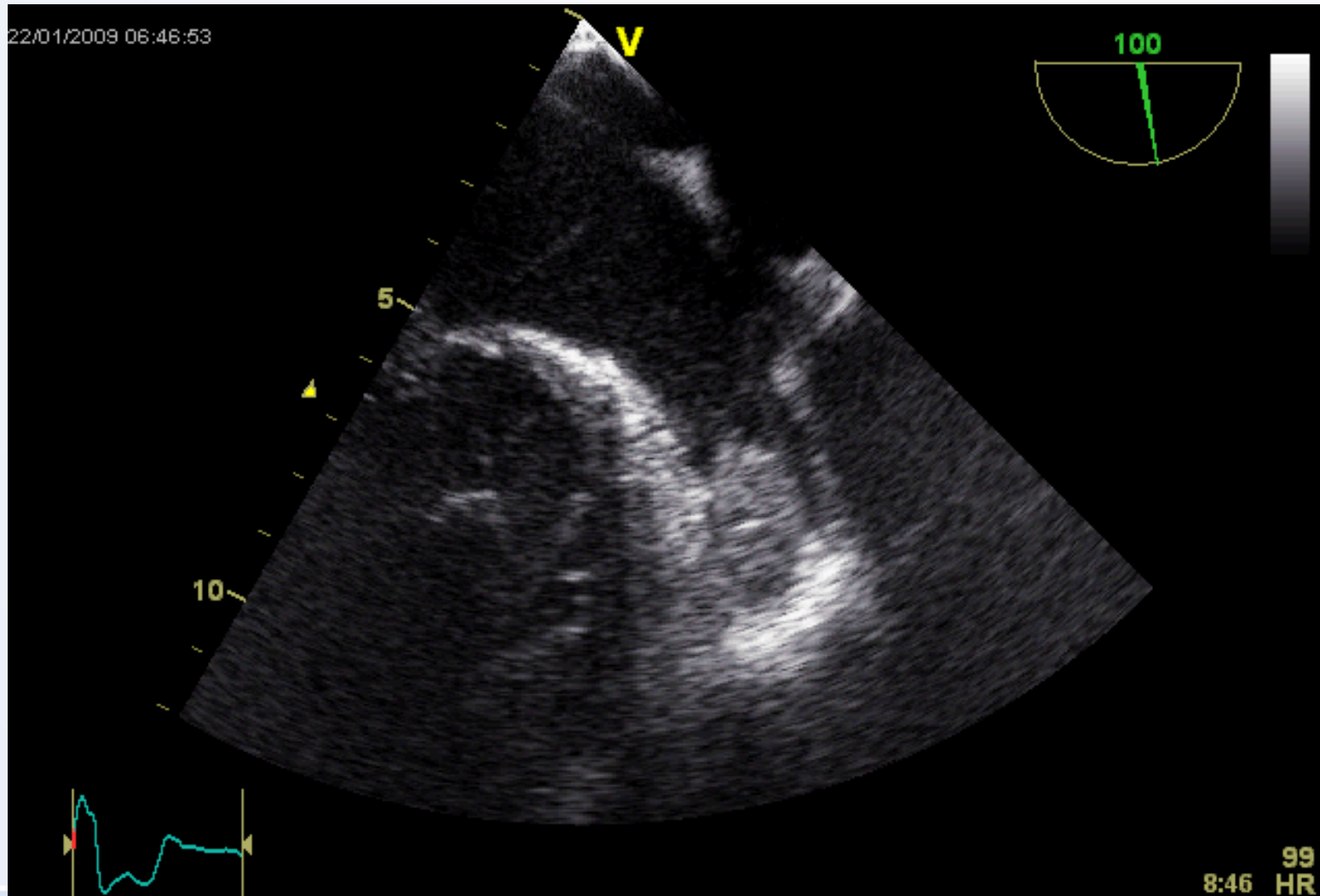




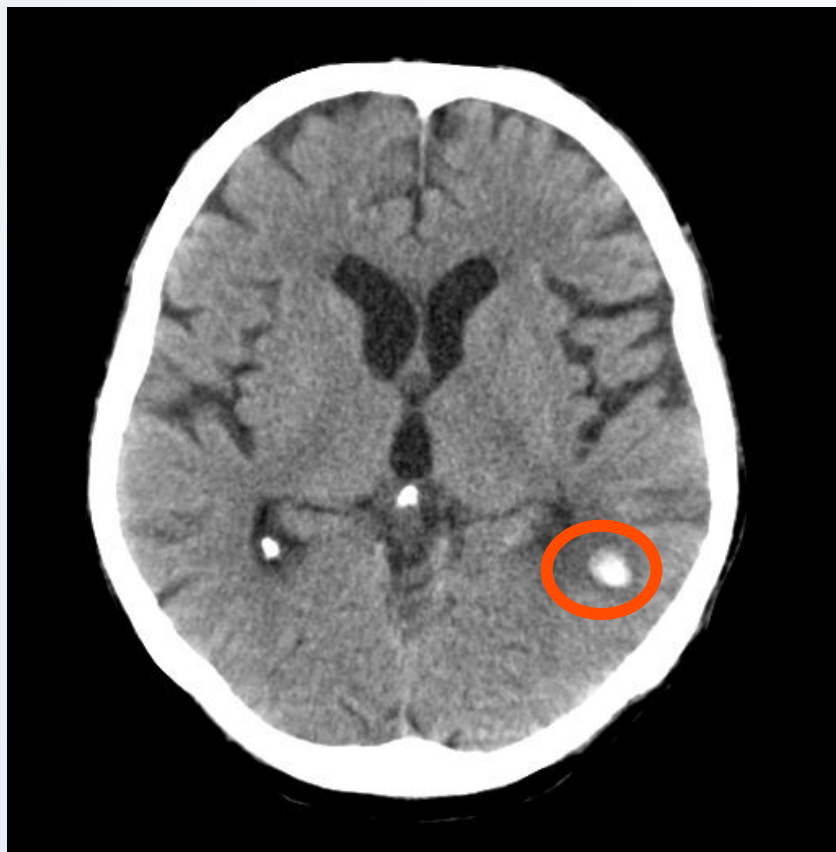
Fibrilace síní: relativní riziko CMP a mortality



Trombus v oušku levé síně



Embolické mozkové příhody



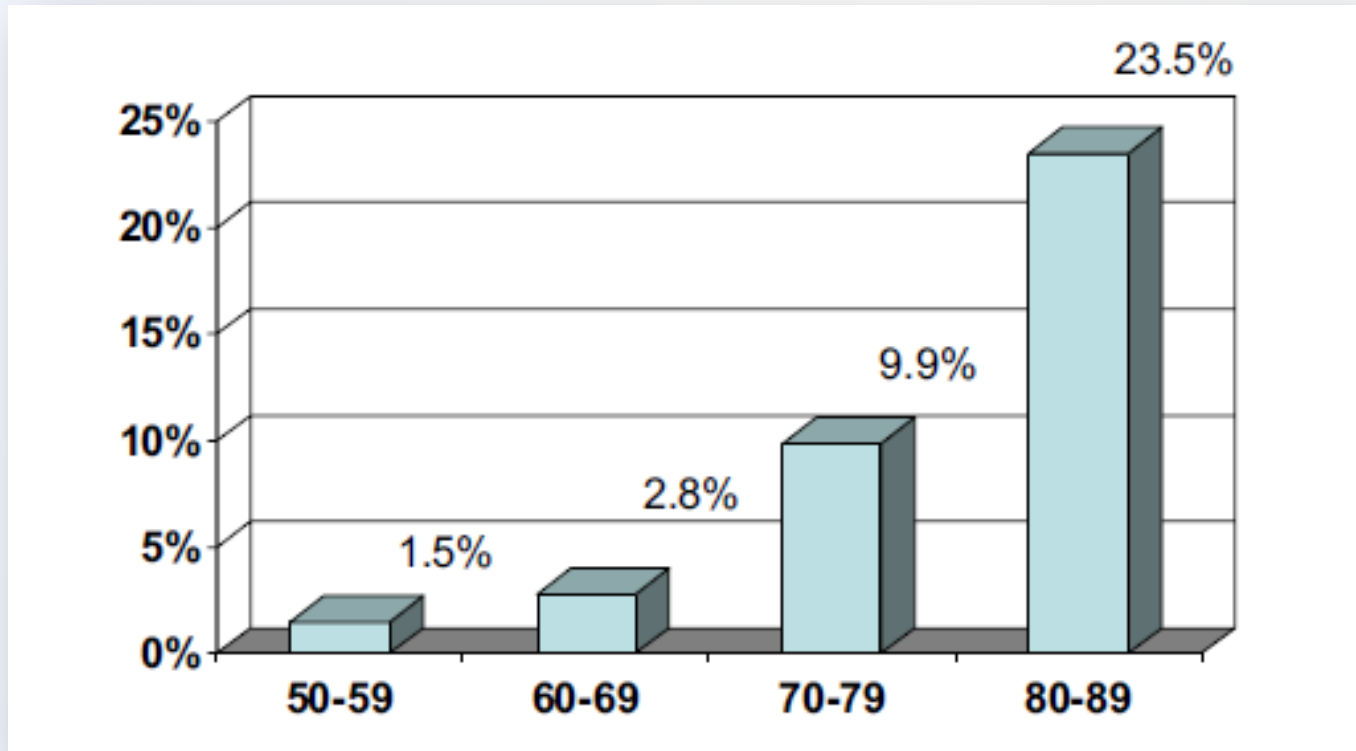
Fibrilace síní a riziko mozkových příhod

Roční četnost mozkových příhod (CMP) u nemocných s FS

Věk	Kategorie rizika	Četnost CMP
<65	Bez rizikových faktorů	1.0%
	≥ 1 rizikový faktor	4.9%
65–75	Bez rizikových faktorů	4.3%
	≥ 1 rizikový faktor	5.7%
>75	Bez rizikových faktorů	3.5%
	≥ 1 rizikový faktor	8.1%

Rizikové faktory mozkové příhody: hypertenze, diabetes, předchozí mozková příhoda

Riziko mozkových příhod podle věku



(a) Risk factors for stroke and thrombo-embolism in non-valvular AF

'Major' risk factors	'Clinically relevant non-major' risk factors
Previous stroke, TIA, or systemic embolism Age ≥ 75 years	Heart failure or moderate to severe LV systolic dysfunction (e.g. LV EF $\leq 40\%$) Hypertension - Diabetes mellitus Female sex - Age 65–74 years Vascular disease ^a

(b) Risk factor-based approach expressed as a point based scoring system, with the acronym CHA₂DS₂-VASc

(Note: maximum score is 9 since age may contribute 0, 1, or 2 points)

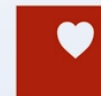
Risk factor	Score
Congestive heart failure/LV dysfunction	1
Hypertension	1
Age ≥ 75	2
Diabetes mellitus	1
Stroke/TIA/thrombo-embolism	2
Vascular disease ^a	1
Age 65–74	1
Sex category (i.e. female sex)	1
Maximum score	9

CHA₂DS₂VASc skóre a výskyt mozkových příhod

(c) Adjusted stroke rate according to CHA₂DS₂-VASc score

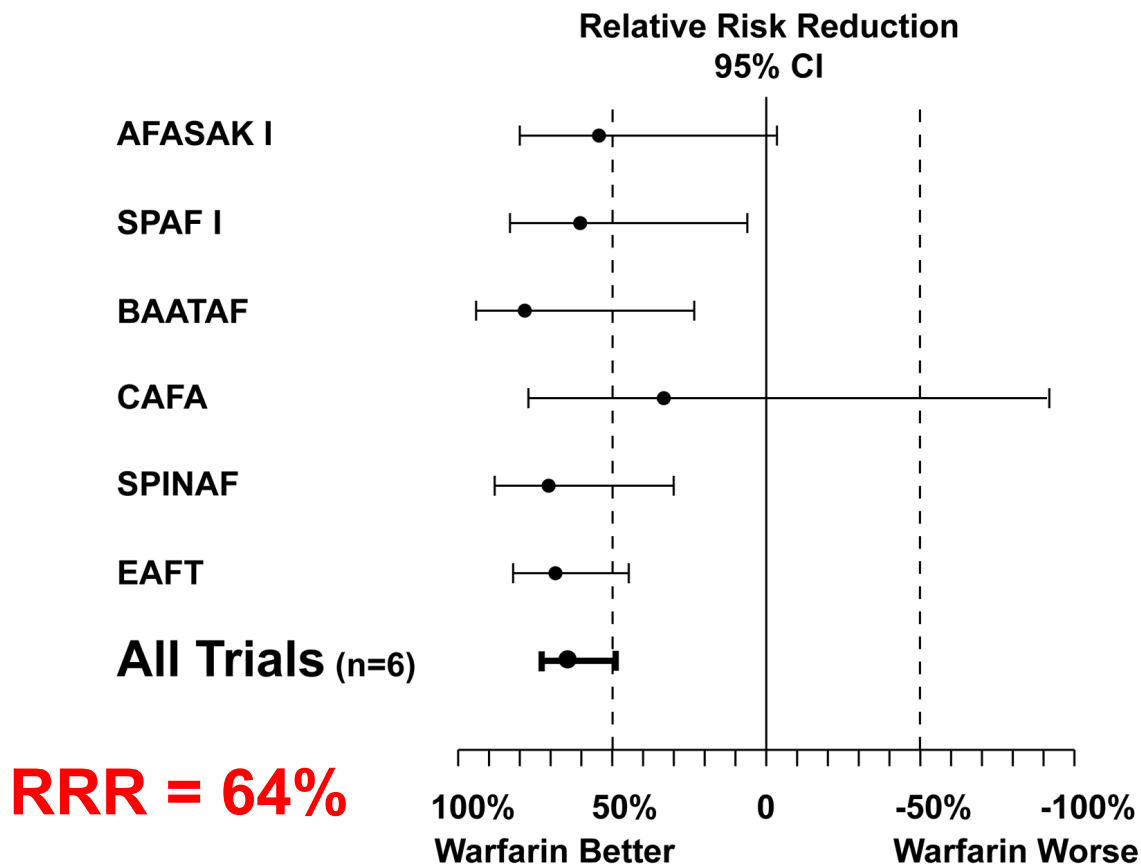
CHA₂DS₂-VASc score	Patients (n = 7329)	Adjusted stroke rate (%/year)^b
0	1	0%
1	422	1.3%
2	1230	2.2%
3	1730	3.2%
4	1718	4.0%
5	1159	6.7%
6	679	9.8%
7	294	9.6%
8	82	6.7%
9	14	15.2%

ESC Guidelines, Eur Heart J 2012



Prokázaný benefit warfarinu

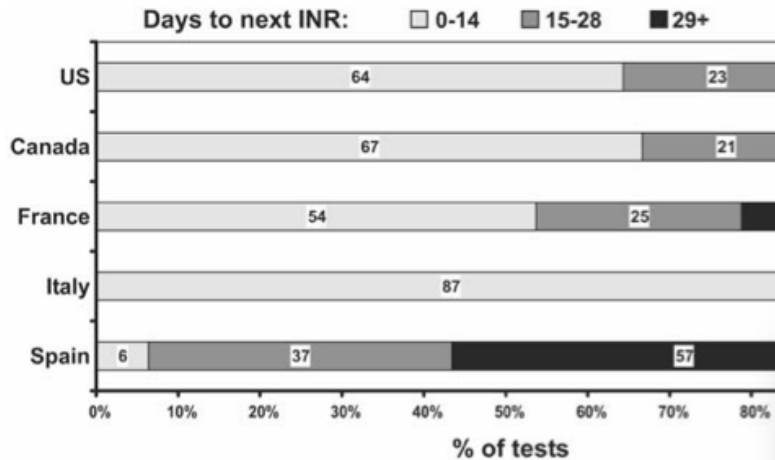
Adjusted-dose Warfarin Compared with Placebo/Control



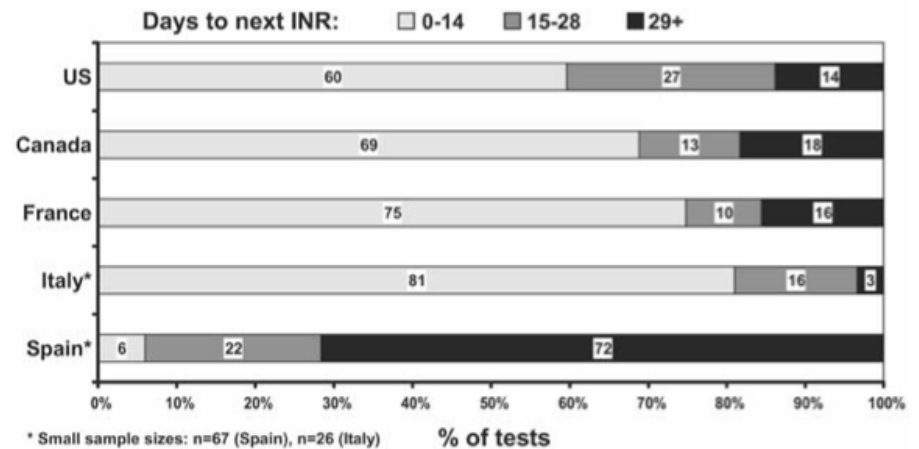
132067-7/05

Bohužel tomu neodpovídá vždy kvalita antikoagulační léčby

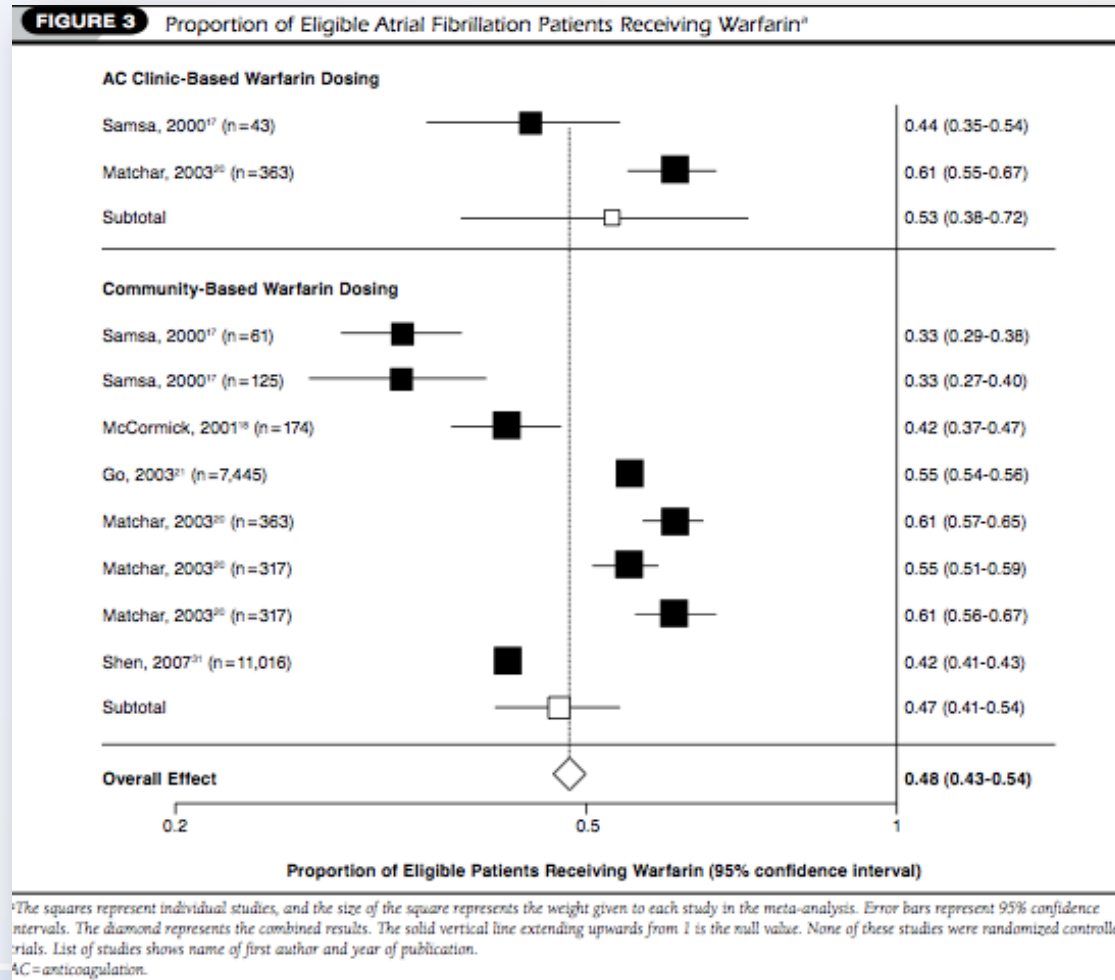
c) Time to next INR (days) when last INR >3.5









a) Time to next INR (days) when last INR < 1.5



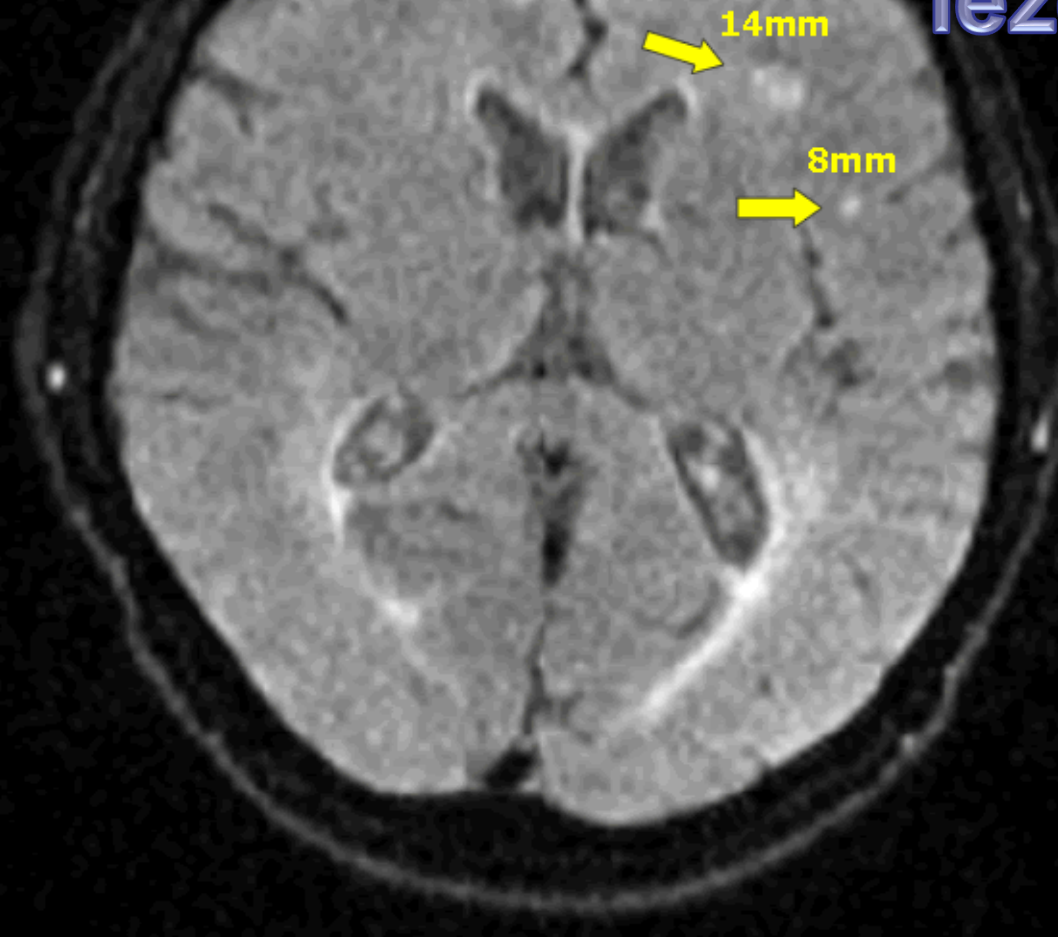
a polovina indikovaných nemocných dokonce nedostává warfarin vůbec...



Analogie léčby krevního tlaku u diabetiků s arteriální hypertenzí

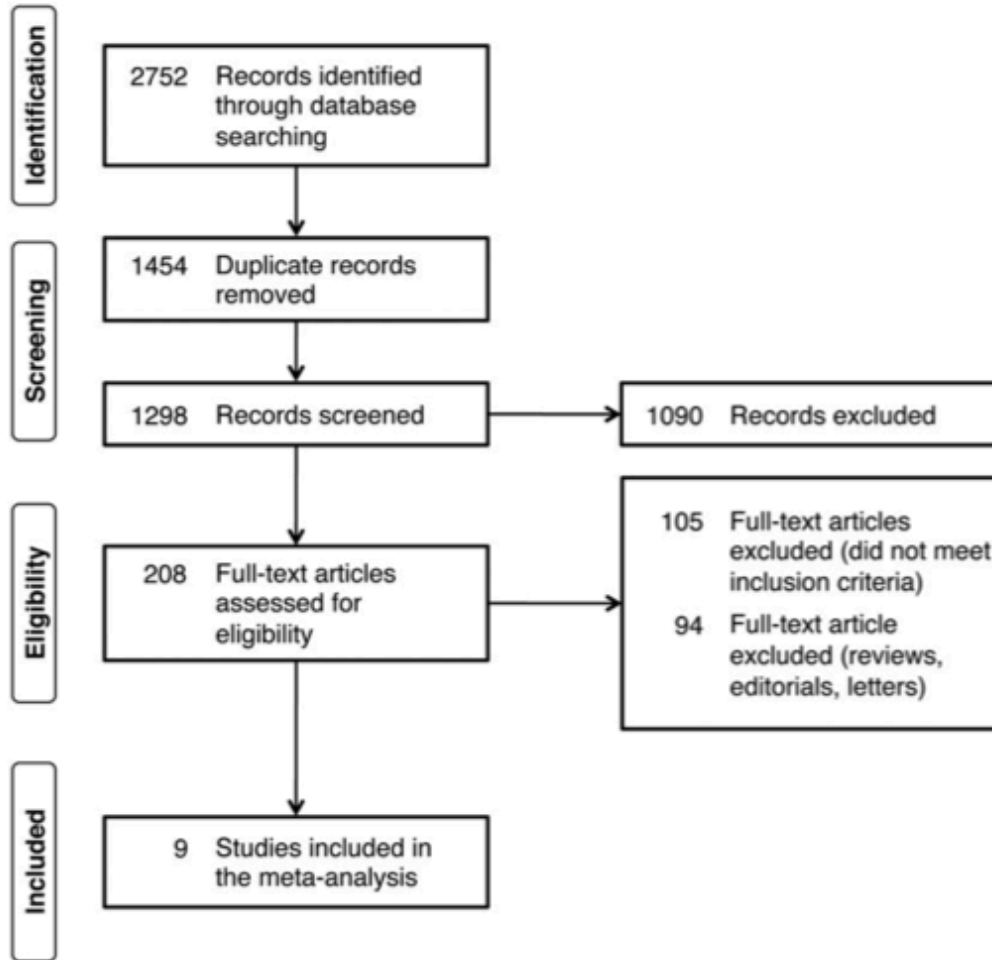
Definition of 'controlled BP'	Treated *	Controlled *
$\leq 160/90$ mmHg 5 studies n=11,339	 68% (range 53-97%)	 37% (range 31-60%)
$\leq 140/90$ mmHg 26 studies n=66,833	 83% (range 32-100%)	 29% (range 5-59%)
$\leq 130/85$ mmHg 24 studies n=49,420	 87% (range 53-100%)	 12% (range 6-30%)

Asymptomatic léze



20 % výskyt
asymptomatických
infarktů v populaci
pacientů
indikovaných k RFA
a na antikogulační
léčbě

Fibrilace síní a riziko demence



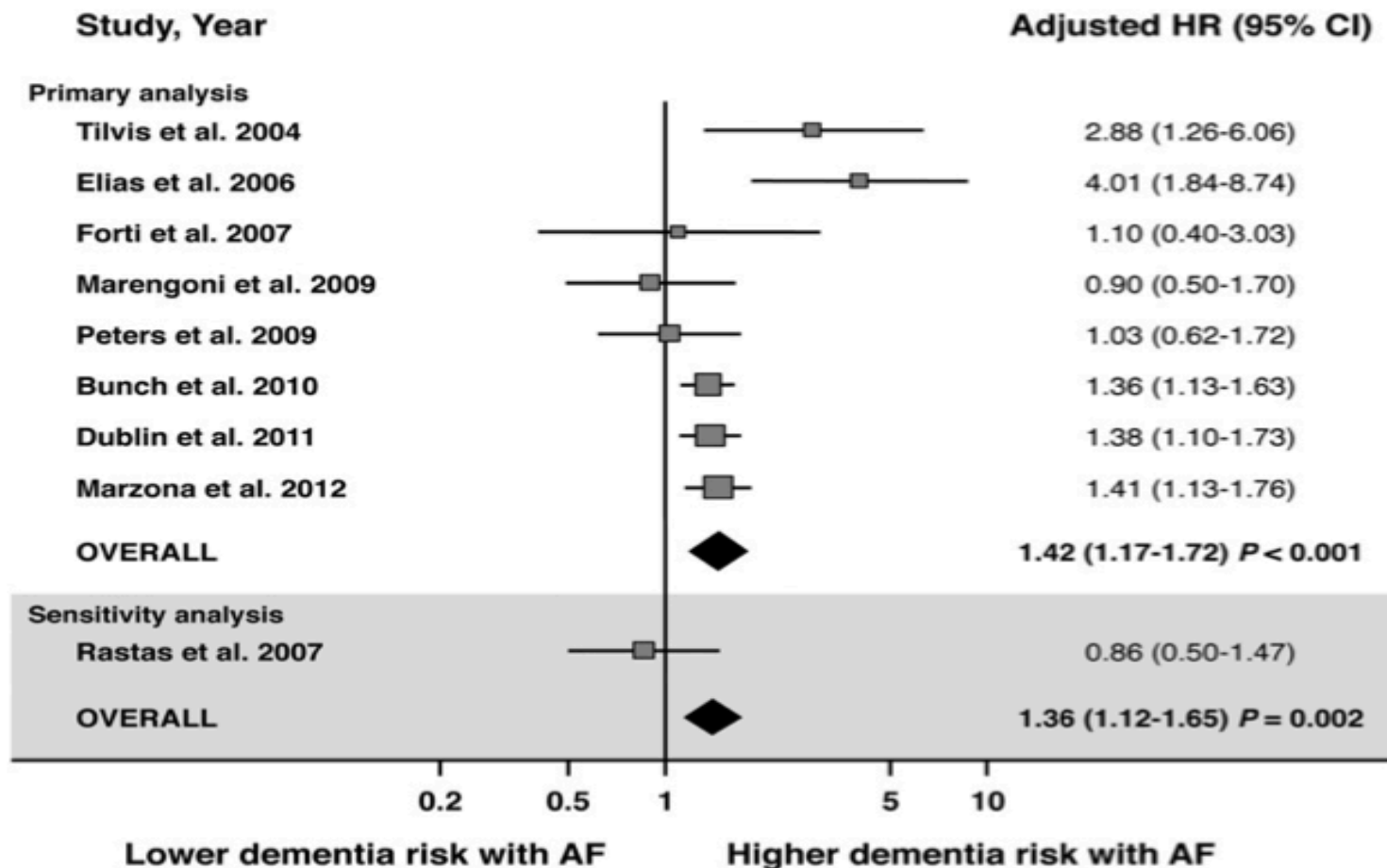
Meta-analýza
observačních studií,
zaměřených na vztah
mezi FS a demencí

8 studií, 77 668 pacientů
11 700 mělo FS (15 %)

FU 7.7 ± 9.1 roků

4773 z 73,321 (6.5%)
mělo dg demence

Fibrilace síní a riziko demence



Stroke. 2013 Feb 26. [Epub ahead of print]

Atrial Fibrillation is Associated With Reduced Brain Volume and Cognitive Function Independent of Cerebral Infarcts.

Stefansdottir H, Arnar DO, Aspelund T, Sigurdsson S, Jonsdottir MK, Hjaltason H, Launer LJ, Gudnason V.

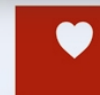
Source

From the Faculty of Medicine, University of Iceland, Reykjavik, Iceland.

As a cross-sectional analysis of 4251 nondemented participants (mean age, 76±5 years) in the population-based Age, Gene/Environment Susceptibility-Reykjavik Study, 330 participants had AF

CONCLUSIONS:

AF is associated with smaller brain volume, and the association is stronger with increasing burden of the arrhythmia. These findings suggest that AF has a cumulative negative effect on the brain independent of cerebral infarcts.



Hypothetical cardiovascular disease cascade in cognitive decline

Cardiovascular disease risk factors

Disturbed hemodynamics

↓ Cerebral hypoperfusion

↓ Energy substrate delivery

↑ Proteinopathy and Abeta misfolding

↓ Clearance of Abeta and various toxins

↓ Executive function
↓ Verbal fluency
↓ Abnormal MMSE

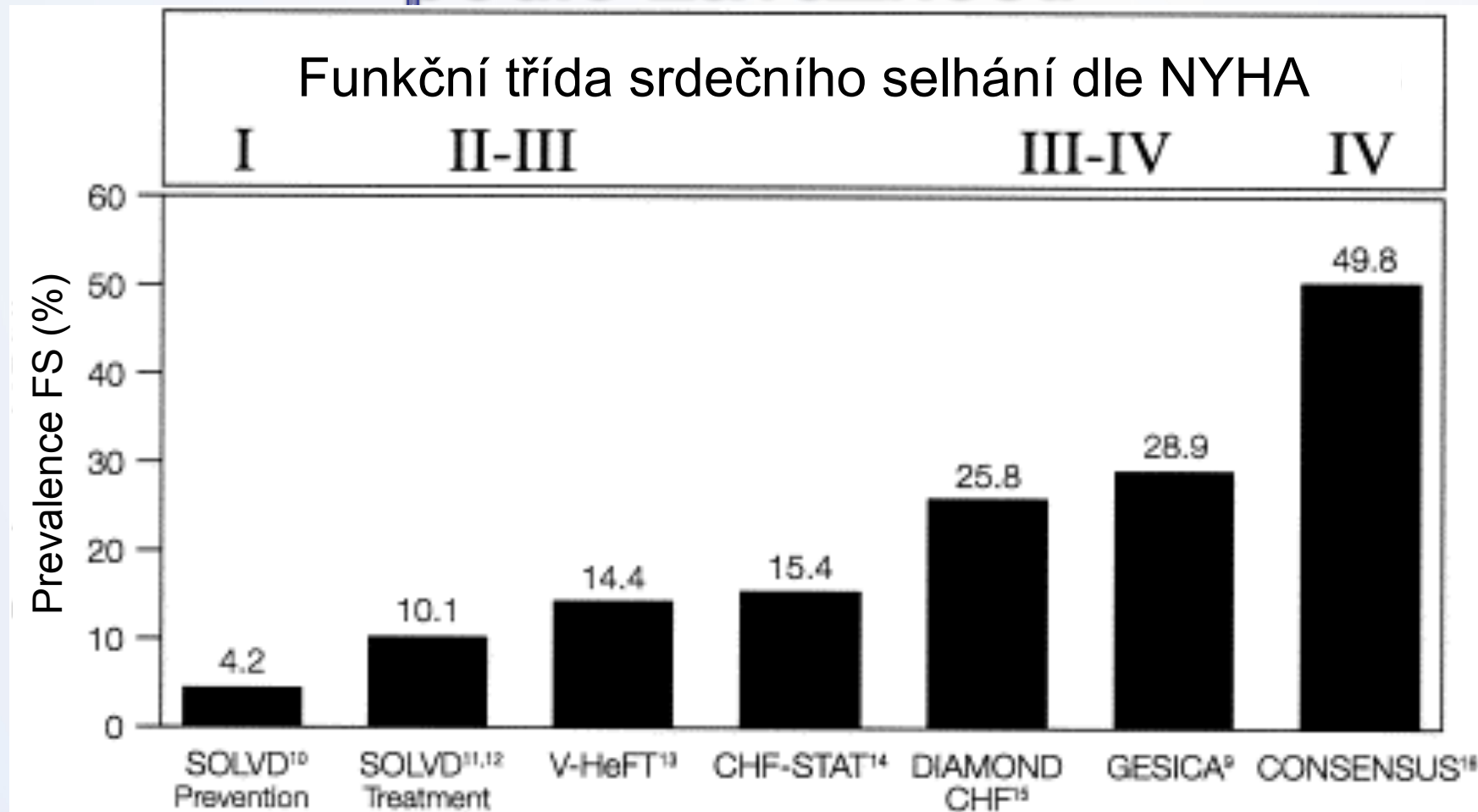
↓ Psychomotor speed
↓ Mental flexibility and sequencing
↓ Memory

CATCH

Porucha funkce LK navozená FS



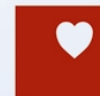
Fibrilace síní a srdeční selhání podle závažnosti



Maisel WH, Stevenson LW.

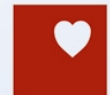
Am J Cardiol 2003;91(suppl):2D-8D

INSTITUT KLINICKÉ A EXPERIMENTÁLNÍ MEDICÍNY
KLINIKA KARDIOLOGIE



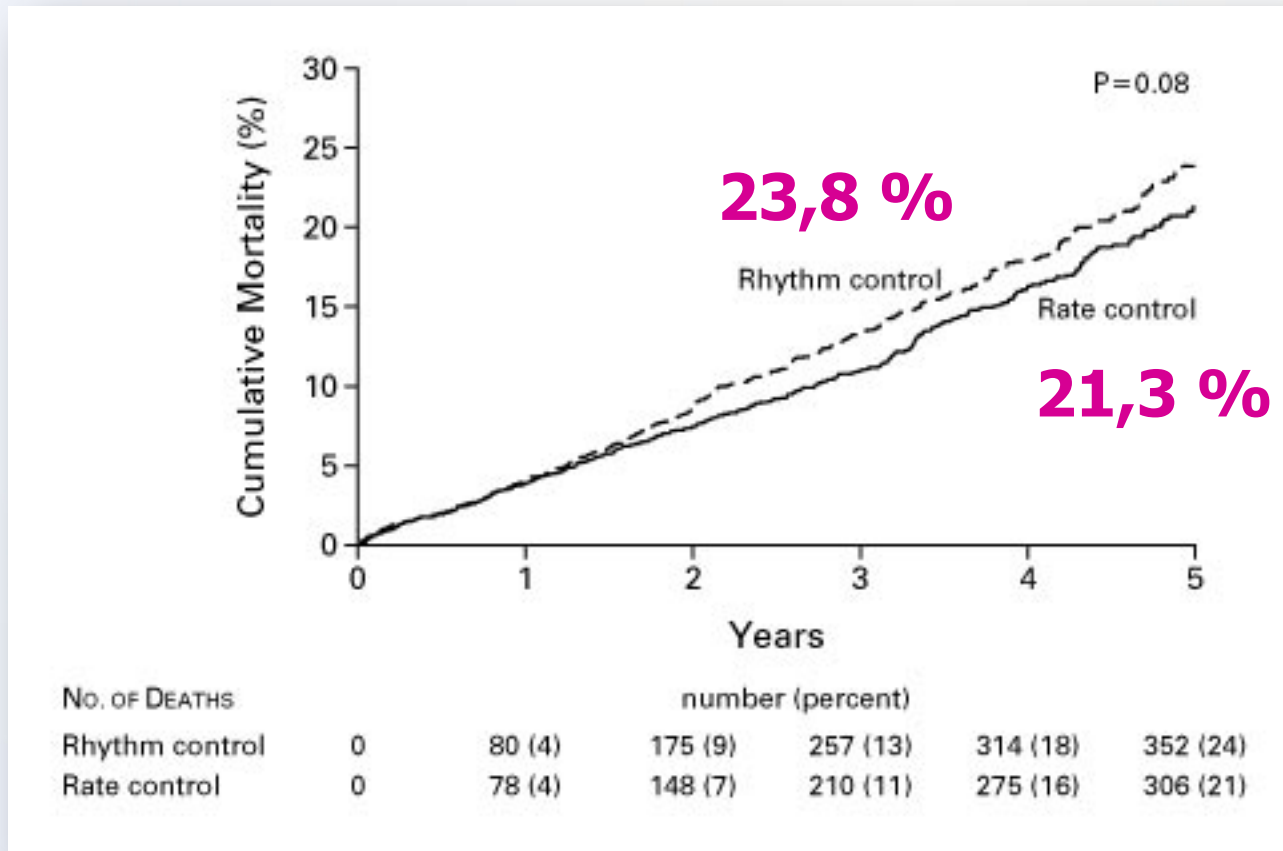
IKEM

Proč se snažit o obnovu a
udržení sinusového rytmu?
(navzdory výsledkům studií typu
AFFIRM)



Studie AFFIRM

N=4060, FS > 6 hod, ≥ 1 rizikový faktor pro CMP (věk>65, hypertenze, DM, předchozí CMP, nízká EF)



Studie AFFIRM nesrovnávala SR s FS

SR ano
(mortalita – 53
ale

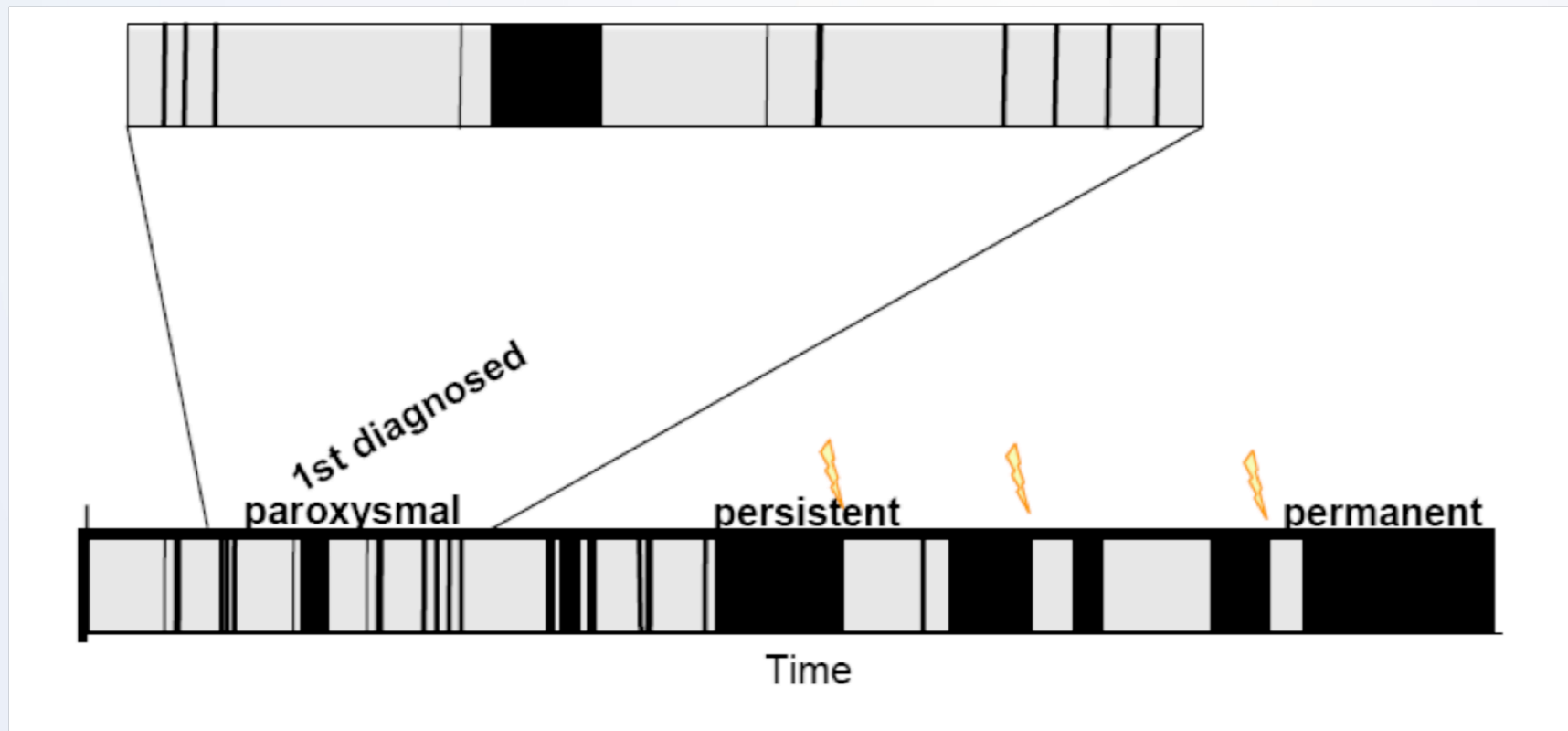
Event	Overall (n = 4,060)	Rate control (n = 2,027)	Rhythm control (n = 2,033)	p value
Number of patients (%)				
CHF	79 (2.4)	37 (2.1)	42 (2.7)	0.58
Pulmonary event	132 (4.6)	24 (1.7)	108 (7.3)	< 0.001
Gastrointestinal event	162 (5)	35 (2.1)	127 (8)	< 0.001
Bradycardia	169 (5.1)	64 (4.2)	105 (6)	0.001
Prolongation of the corrected QT interval (>520 msec)	35 (1.1)	4 (0.3)	31 (1.9)	< 0.001
Other	590 (19.8)	176 (14)	414 (25.4)	< 0.001

CHF = congestive heart failure.

AFFIRM investigators. *N Engl J Med.* 2002;347:1825-33.

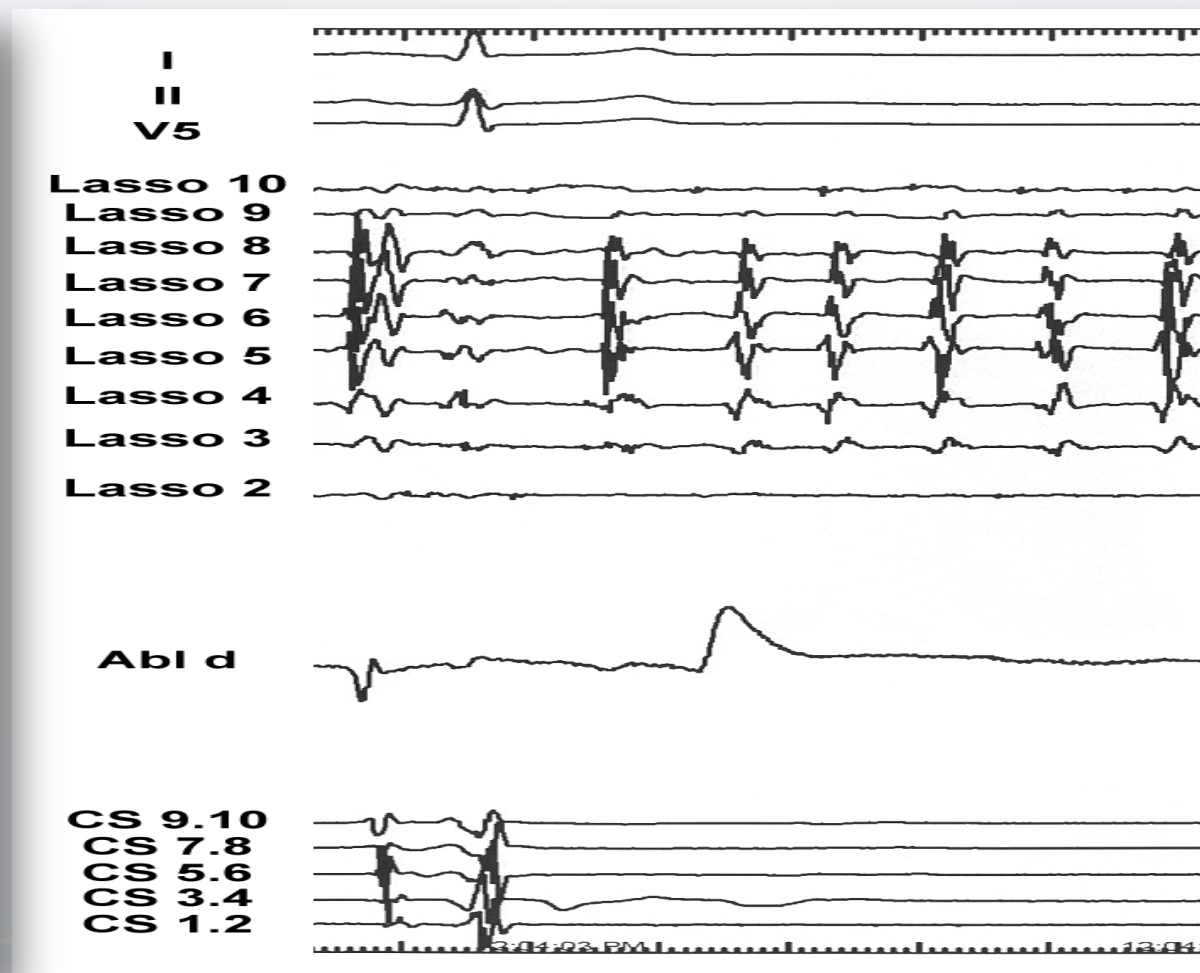
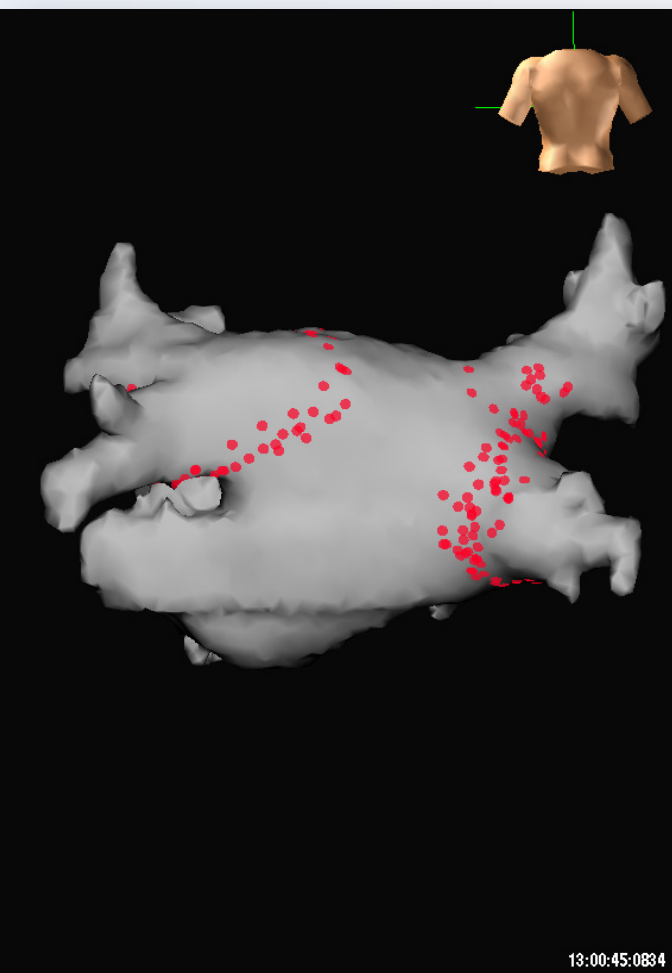
ythmika
ne
a + 49%)

Progresivní charakter arytmie

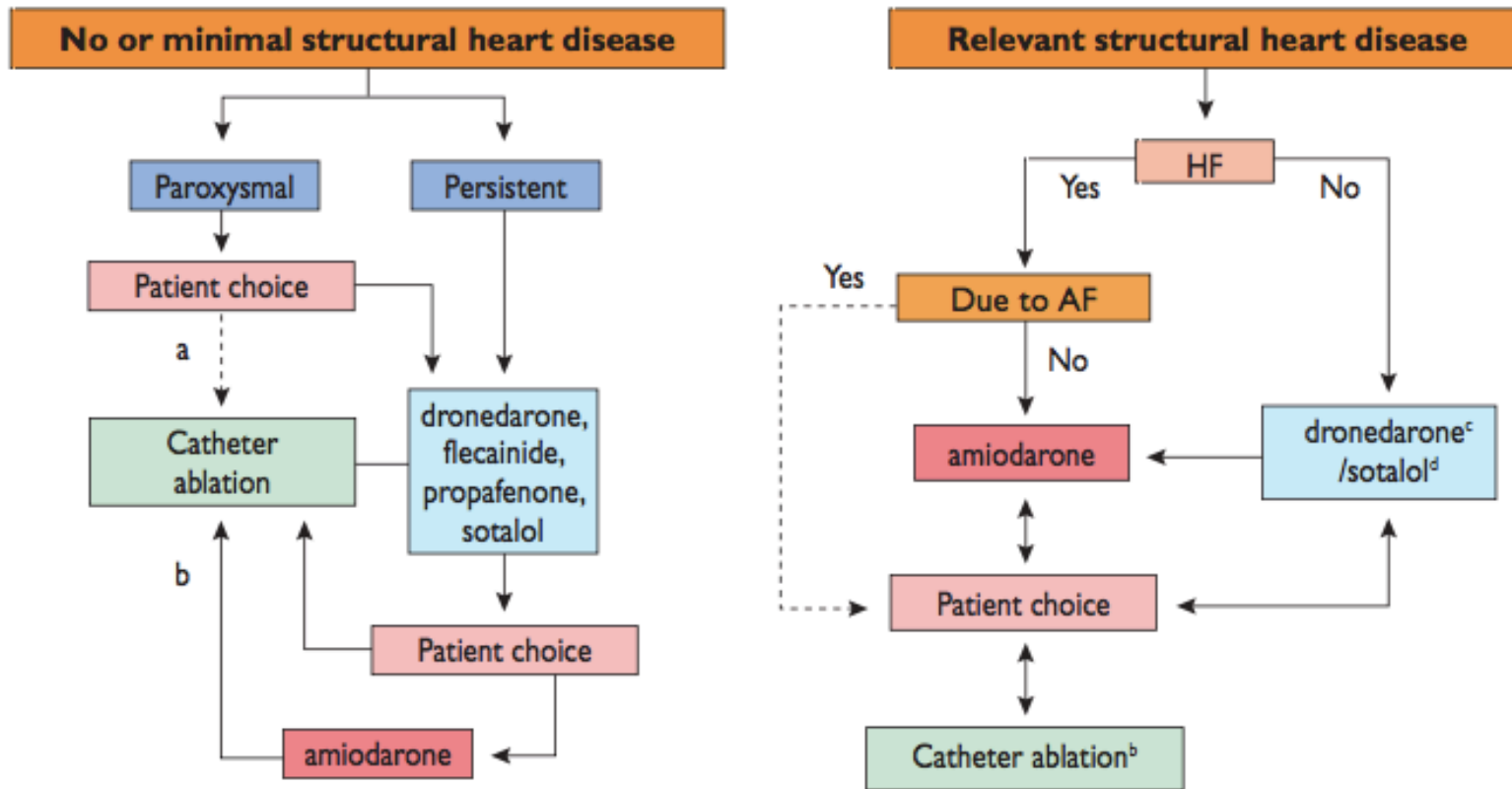


Podle P Kirchhofa, 2009

Katetrizační ablace mění scénář..



Co říkají Doporučení ESC?



AF = atrial fibrillation; HF = heart failure. ^aUsually pulmonary vein isolation is appropriate. ^bMore extensive left atrial ablation may be needed. ^cCaution with coronary heart disease. ^dNot recommended with left ventricular hypertrophy. Heart failure due to AF = tachycardiomyopathy.

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	I	A	192, 193

Doporučení pro ablací

These recommendations are restricted to: (i) highly experienced centres/investigators; (ii) appropriate patient selection; (iii) careful evaluation of treatment alternatives and (iv) patient preference.

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
---	-----	---	---------

Indikace k ablaci FS

2012 focused update of the ESC Guideline

- Symptomatická paroxysmální FS se symptomatickými rekurencemi na AA léčbě, při preferenci kontroly rytmu pacientem a při provedení trénovaným operátorem ve zkušeném centru (třída I, úroveň A)
- Katetrizační ablaci lze zvažovat jako terapií první linie u vybraných pacientů se symptomatickou paroxysmální FS, pokud si tak pacient přeje po zvážení přínosu a rizika

Worldwide Survey on Catheter Ablation II

Vstupní kritéria a výsledky FU

	Previous Survey	Current Survey
Period Investigated	1995–2002	2003–2006
No. of centers enrolled	90	85
No. of patients	8745	16 309
No. of patients per center	97	192
No. procedures	12 830	20 825
No. procedures per patient	1.5	1.3
Male, %	63.8	60.8
Lower and upper age limit for entry	18–82	15–90
Proportion of centers (%) performing ablation of		
Paroxysmal AF	100	100
Persistent AF	53.4	85.9
Long-lasting AF	20	47.1
Success rate, %, median		
Free of AADs	52.0	70.0
With AADs	23.5	10.0
Overall	75.5	80.0
Overall complication rate, %	4.0	4.5
iatrogenic flutter	3.9	8.6

Závažné komplikace

Type of Complication	No. of Patients	Rate, %
Death	25	0.15
Tamponade	213	1.31
Pneumothorax	15	0.09
Hemothorax	4	0.02
Sepsis, abscesses, or endocarditis	2	0.01
Permanent diaphragmatic paralysis	28	0.17
Total femoral pseudoaneurysm	152	0.93
Total artero-venous fistulae	88	0.54
Valve damage/requiring surgery	11/7	0.07
Atrium-esophageal fistulae	6	0.04
Stroke	37	0.23
Transient ischemic attack	115	0.71
PV stenoses requiring intervention	48	0.29
Total	741	4.54

Komplikace

Atrial Fibrillation Ablation Pilot Registry

Adverse Events – 1/2

No
1282/1391 (92.2%)

Yes
107/1391 (7.7%)

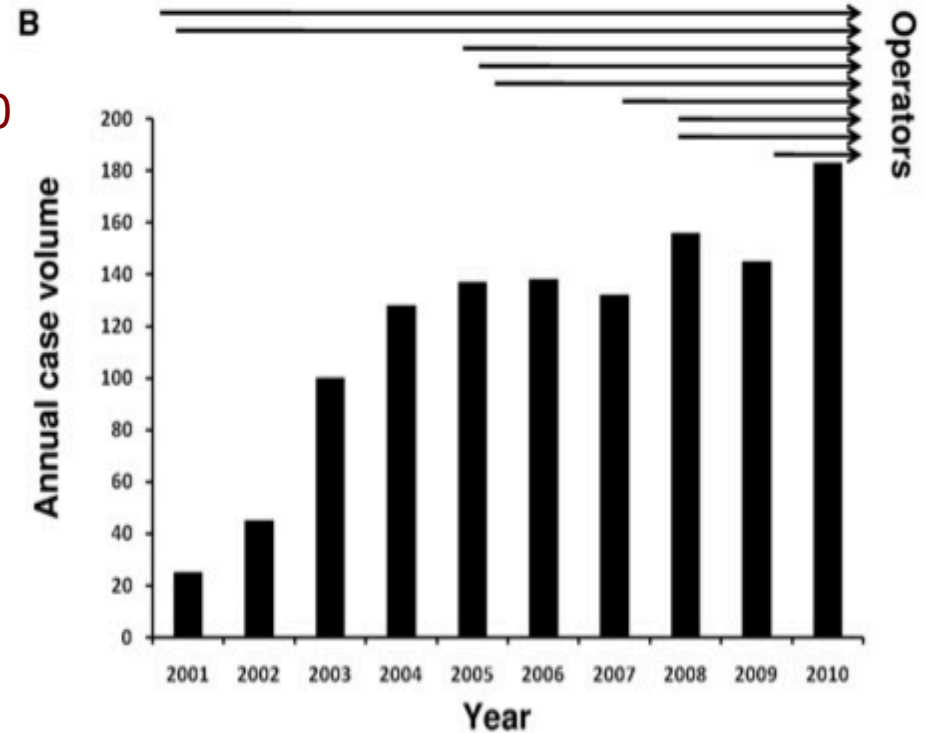
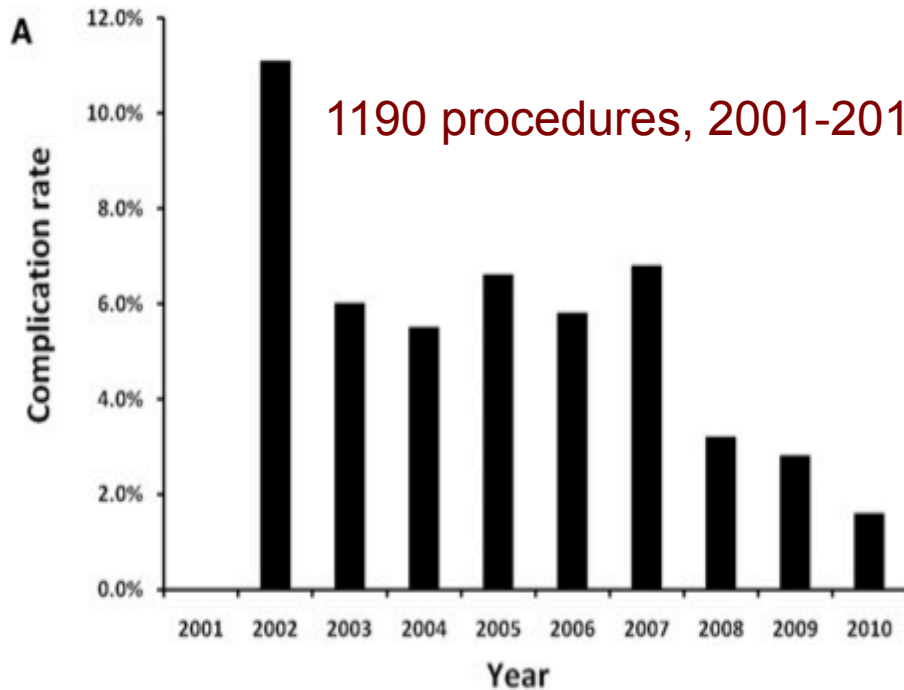
Unknown
2/1391 (0.1%)



	Yes (n. 107 pts)
CV, %	43.0
General, %	5.6
GI, %	0.9
Neuro, %	8.4
Peripheral/vascular, %	16.8
Pulmonary, %	7.5
Other, %	28.0

Cardiac tamponade
1.3 %

Na zkušenostech opět záleží...

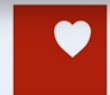
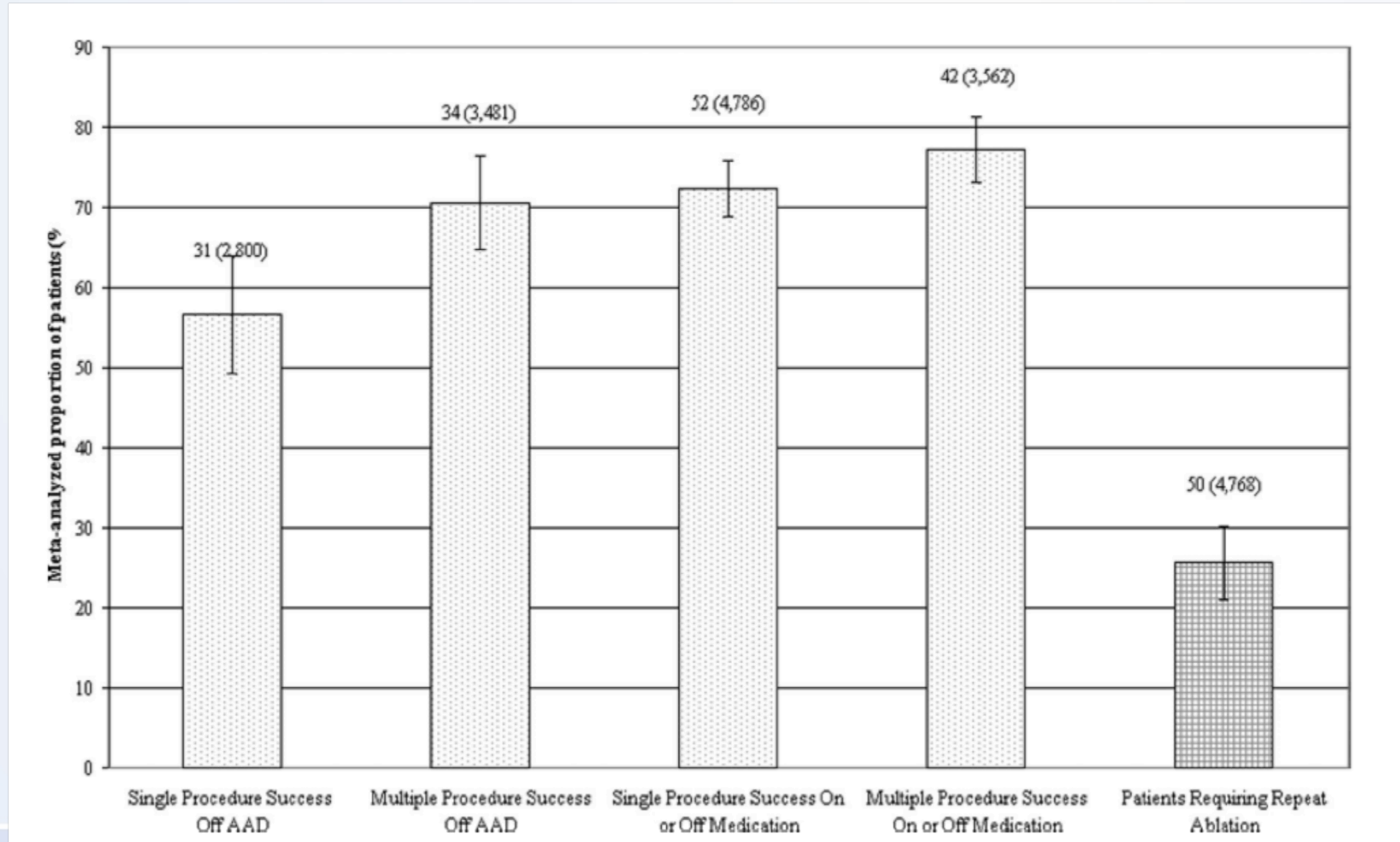


Naše zkušenosti - IKEM

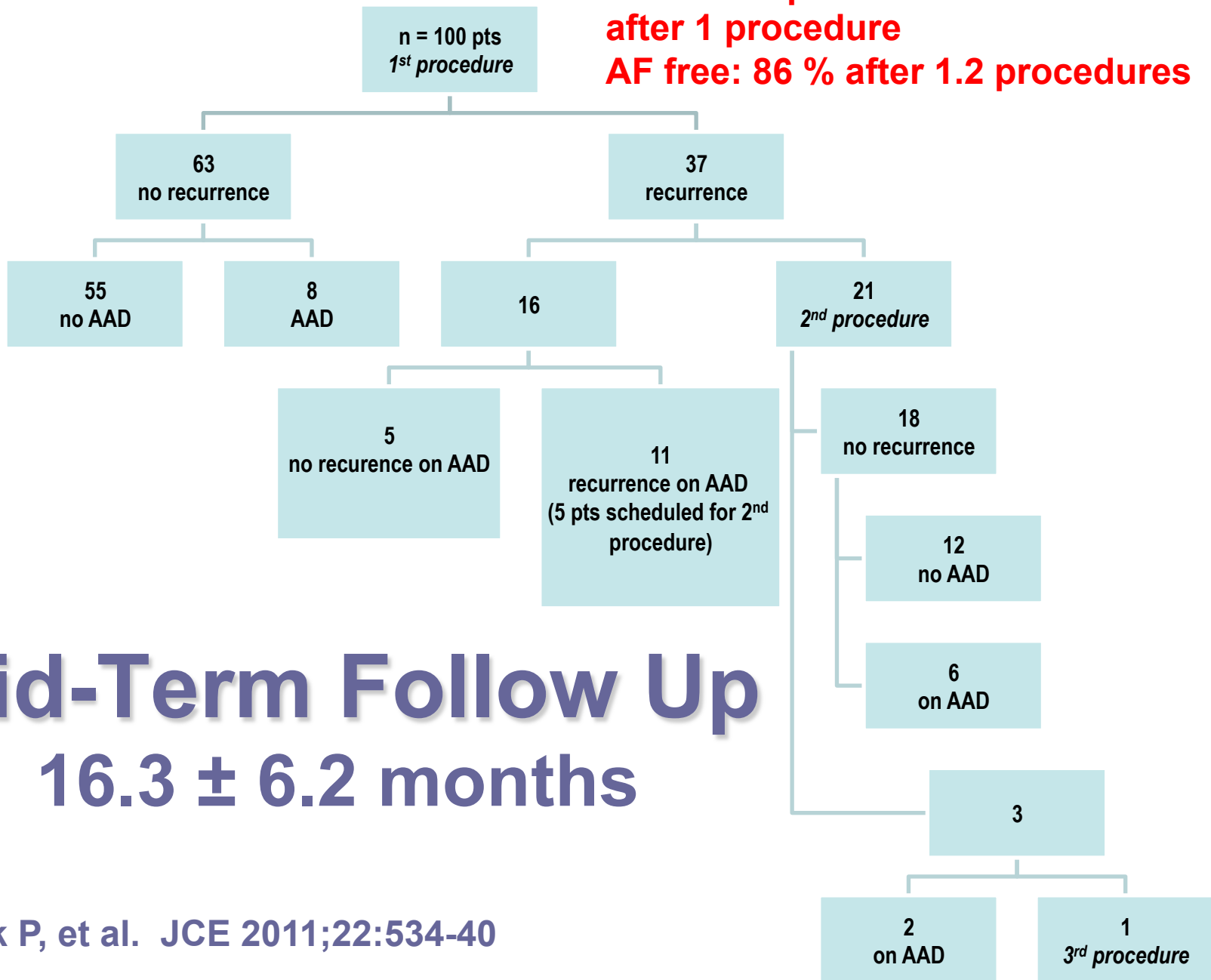
Baseline Characteristics	
1192 procedures in 959 patients	
Age	58 ± 9 years
Males	70.8%
Persistent AF	35.9%
CHA ₂ DS ₂ VASc	1.5 ± 1.3
LVEF<55%	26.5%
LA diameter	43 ± 5 mm
Procedural time	259 ± 69 min
Ablation time	2699 ± 1359 s
Complex procedure	43.5%
Re-do	36.1%
Robotic ablation	22.4%

- 40/1192 signifikantních komplikací (během výkonu a do 3 měsíců FU)
- Pozorované (3.3%)
- 12 (1.0%) potencionálně život ohrožující
 - 2 tamponády/1 hemoperikard (0.25%)
 - 2 CMP/3 TIA (0.42 %)
- Žádné úmrtí

Success Rate of AF Ablation in Real Life



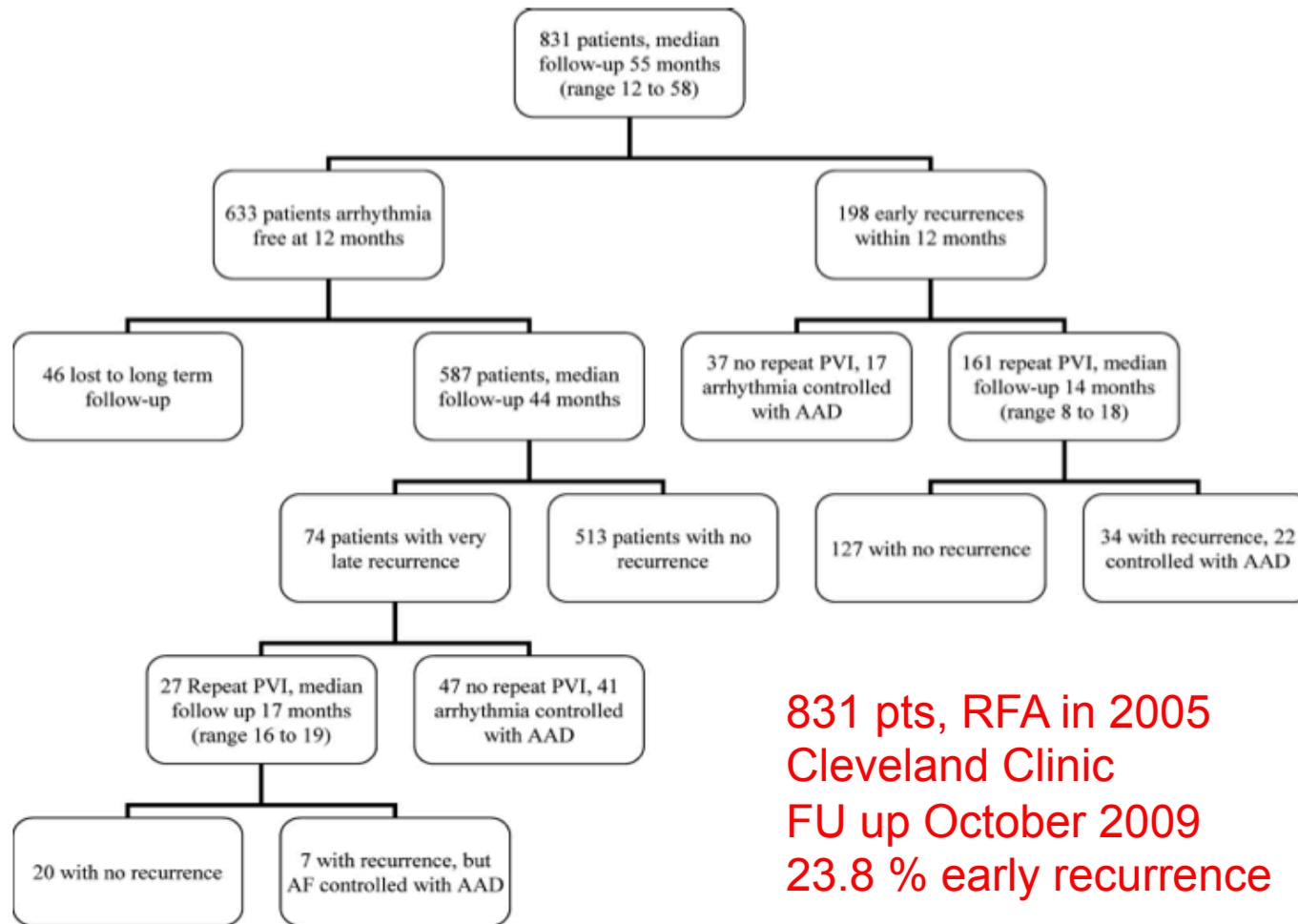
**Clinical improvement –EHRA I-II in 79 %
after 1 procedure
AF free: 86 % after 1.2 procedures**



Mid-Term Follow Up

16.3 ± 6.2 months

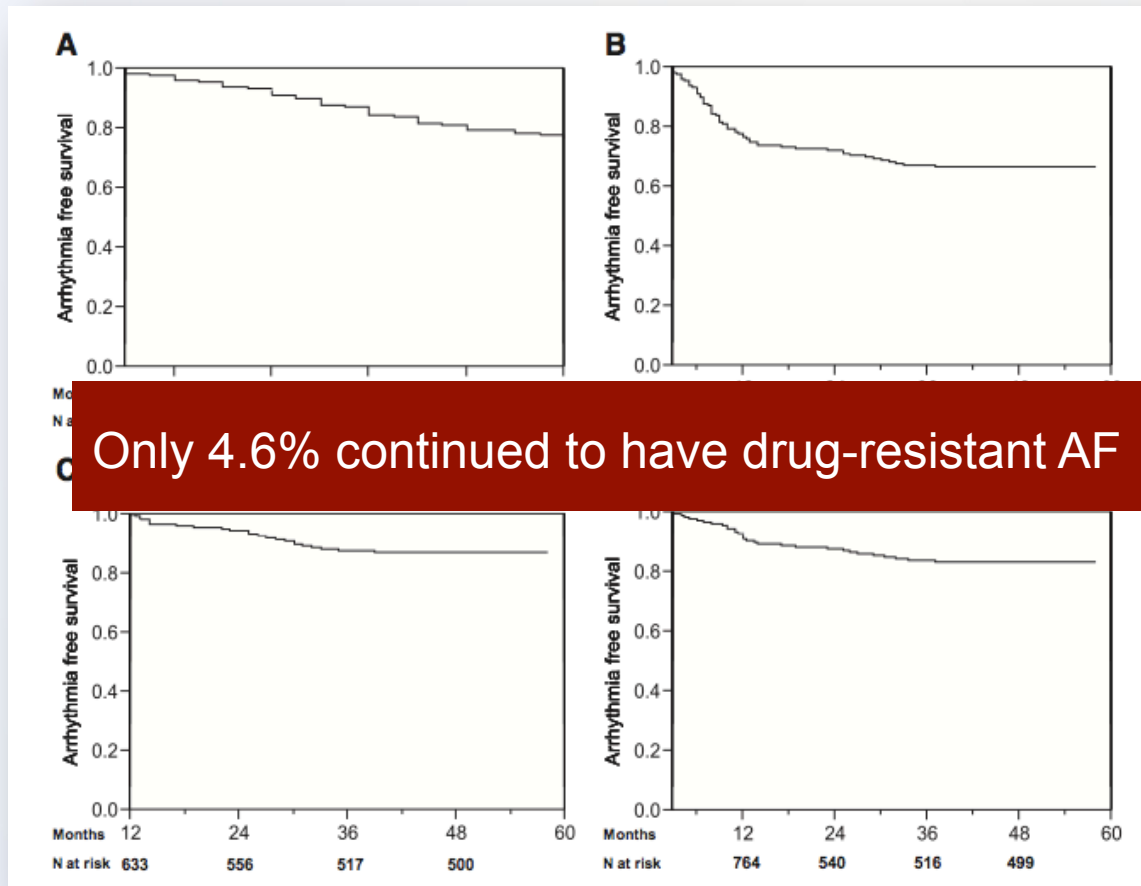
Long-Term Outcome



831 pts, RFA in 2005
Cleveland Clinic
FU up October 2009
23.8 % early recurrence

Arrhythmia Free Survival

FU 55months, clinical improvement 89.9 %
79.4 % w/o drugs



Hussein AA, et al. Circ Arrhythm EP 2011;4:271-8

Risk/Benefit Ratio

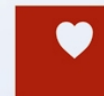
	Longstanding*	Persistent	Paroxysmal
First-line	—	—	+
Failed first-line drug	—	+	++
Failed second-line drug	+	++	+++
Failed multiple drugs	++	+++	+++

+, Balance of risk and benefit in favour of catheter ablation.

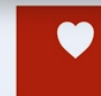
* Ongoing symptomatic AF for ≥ 1 year.

Co si odnést domů?

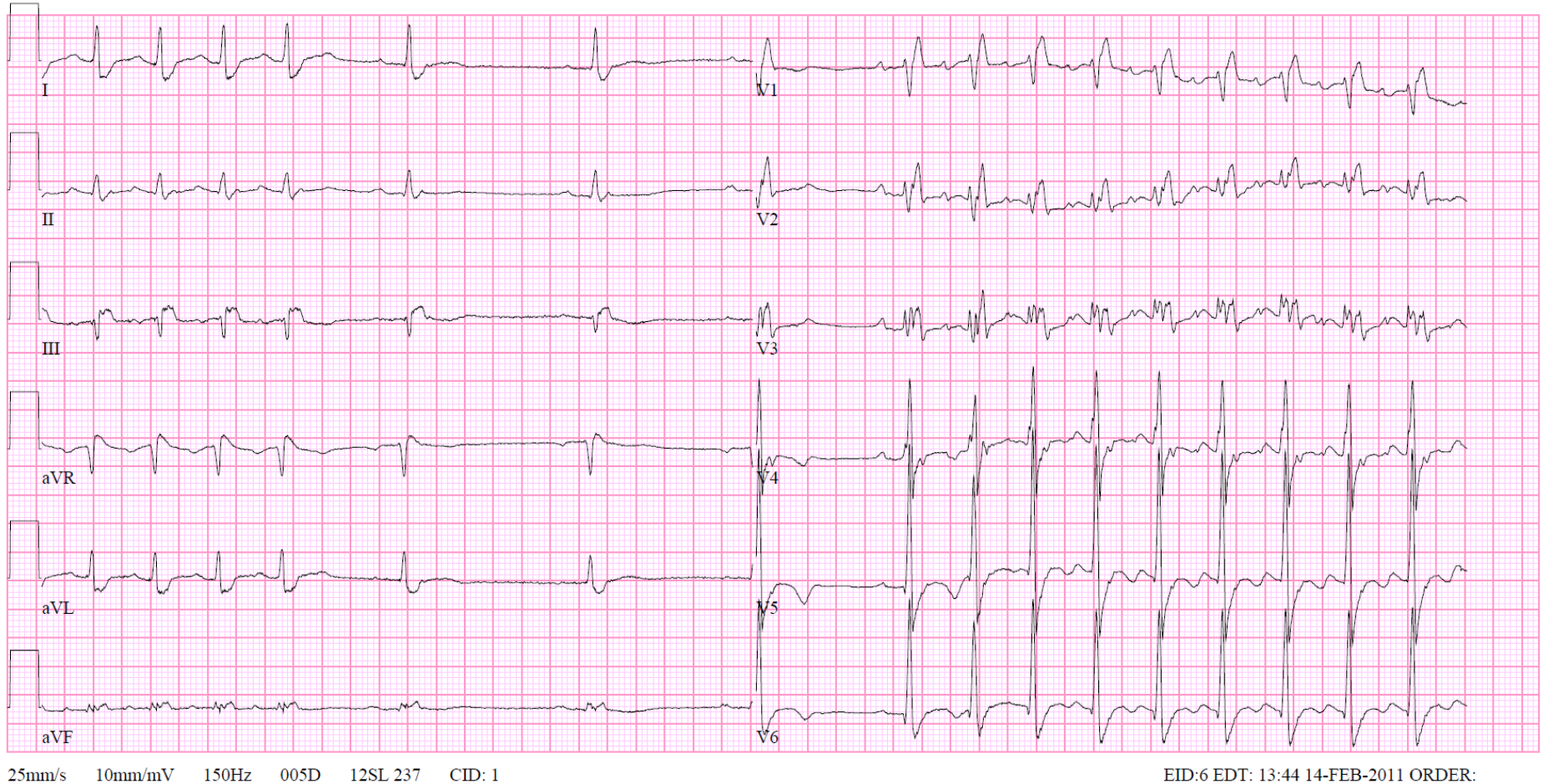
- Fibrilace síní je podle hromadících se údajů nebezpečnější arytmií než se dosud traduje
- Je spojena s významnou morbiditou a zvýšenou mortalitou
- Antikoagulační léčba je základem profylaxe tromboembolismu
- Při rozhodování o strategii léčby FS záleží na typu arytmiie, přítomnosti symptomů, věku nemocných, přítomnosti dalších onemocnění
- Začínají se hromadit data o tom, že kontrola rytmu pomocí katetrizační ablace může zlepšit prognózu nemocných



Thank you very much for your attention...



Stable SR till 2010



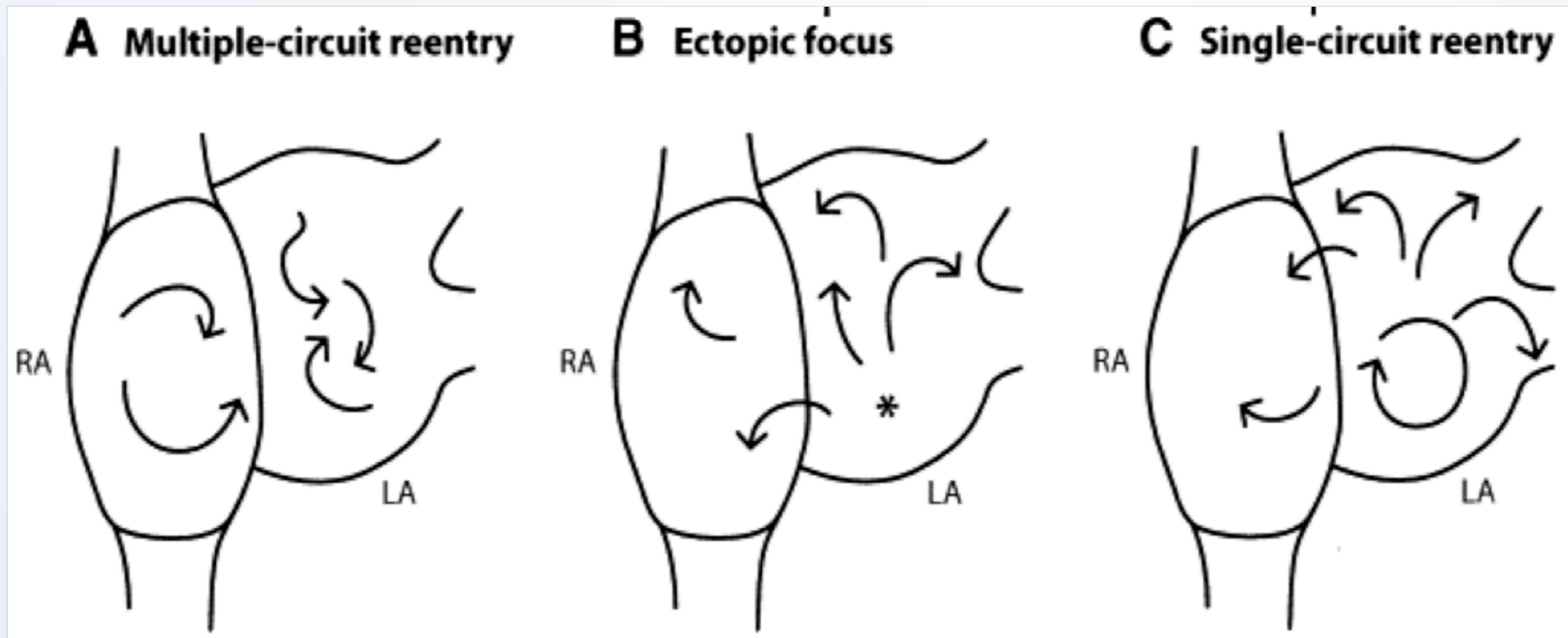
- New runs of AT and episodes of persistent AT

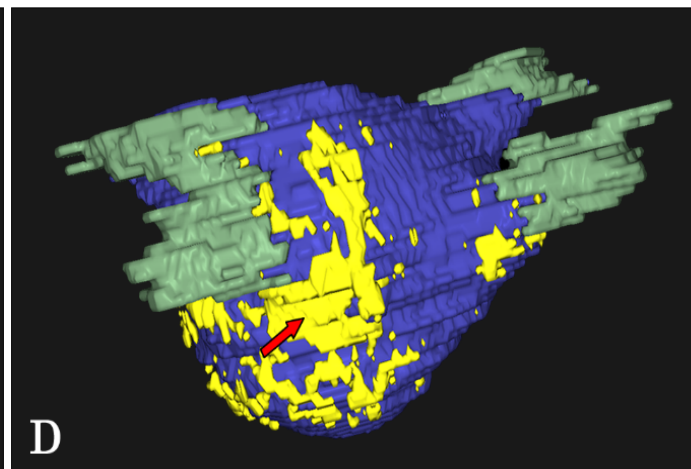
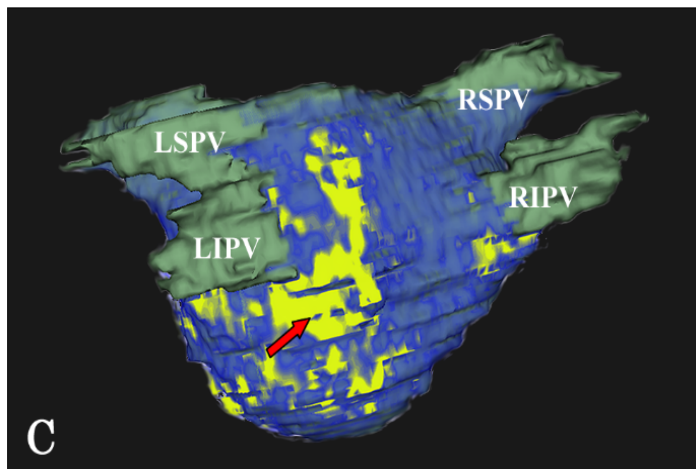
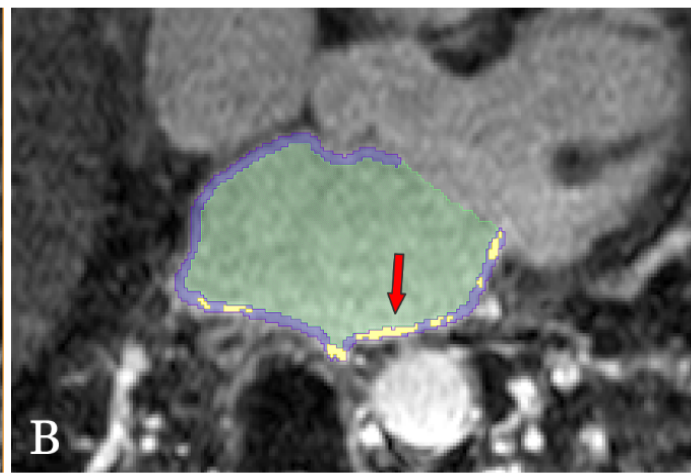
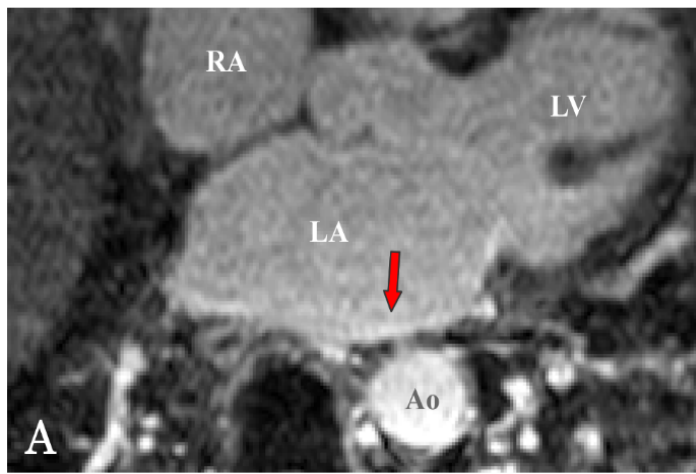
AF Mechanisms

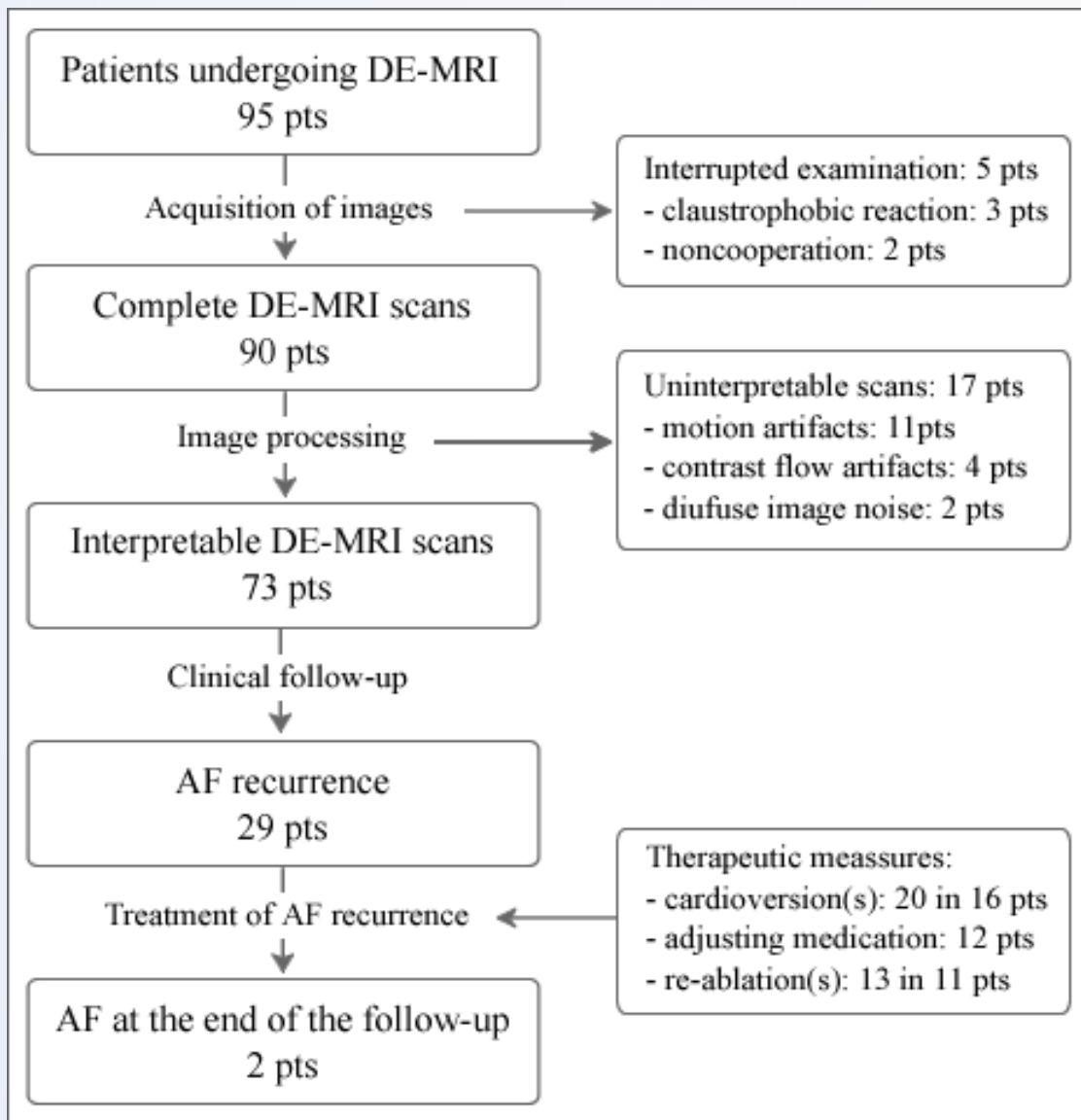
Garrey

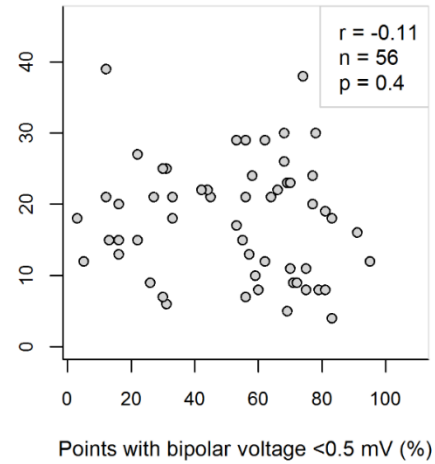
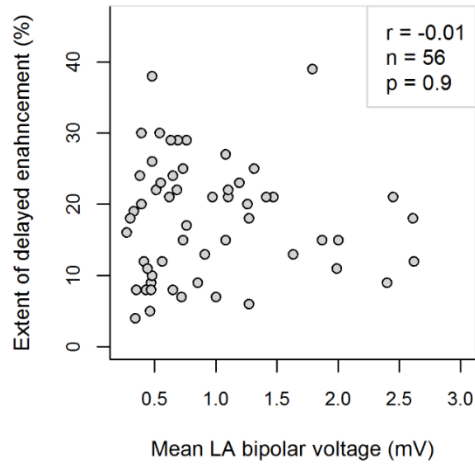
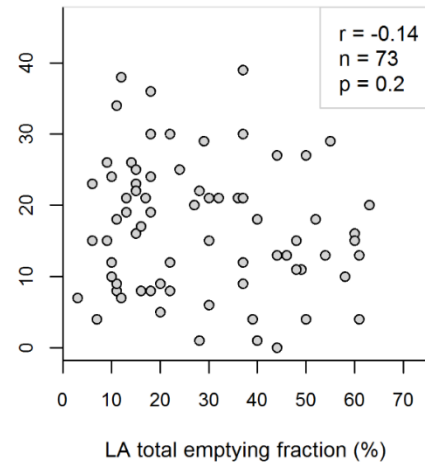
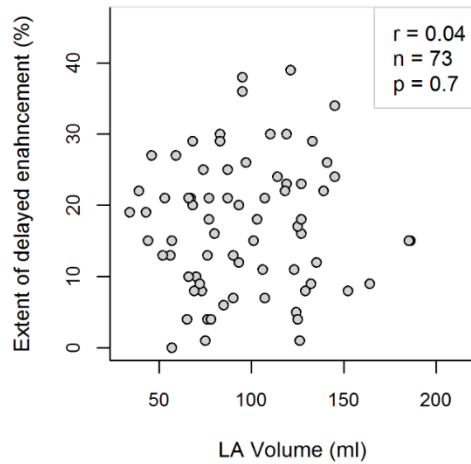
Engelman, Witenberg

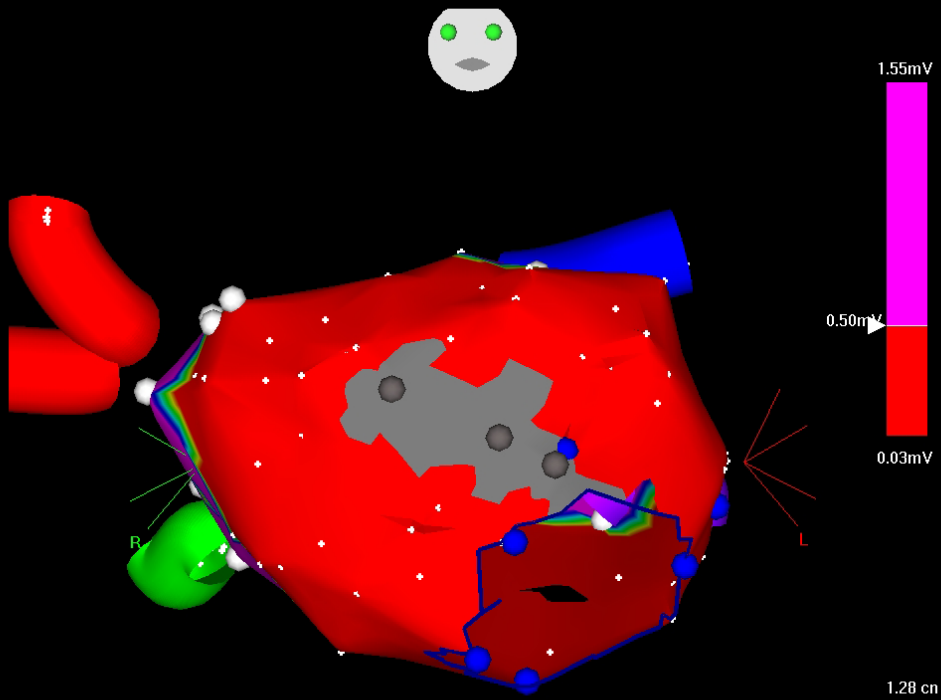
Lewis



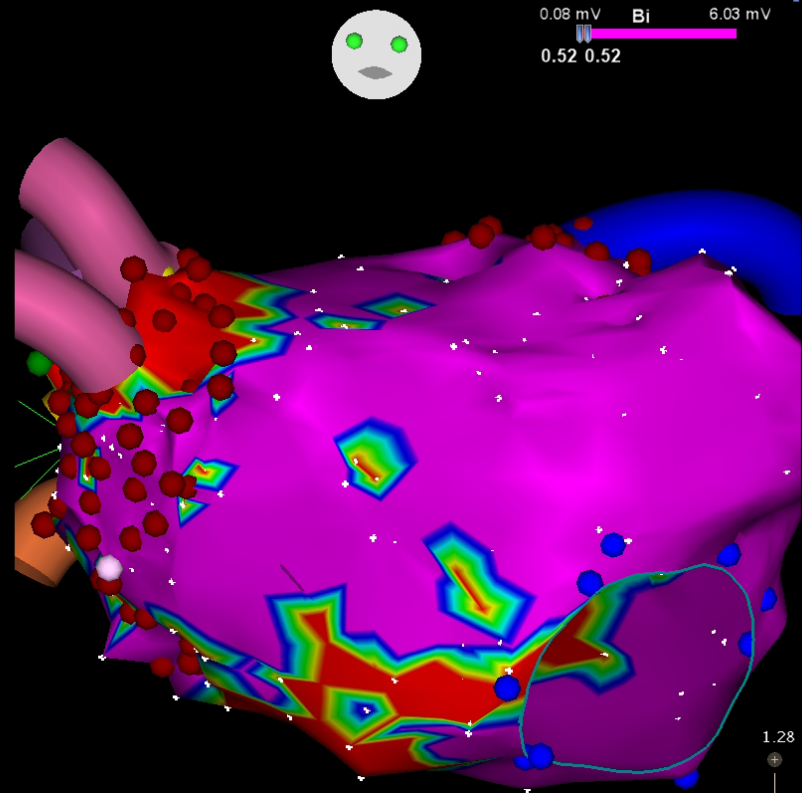






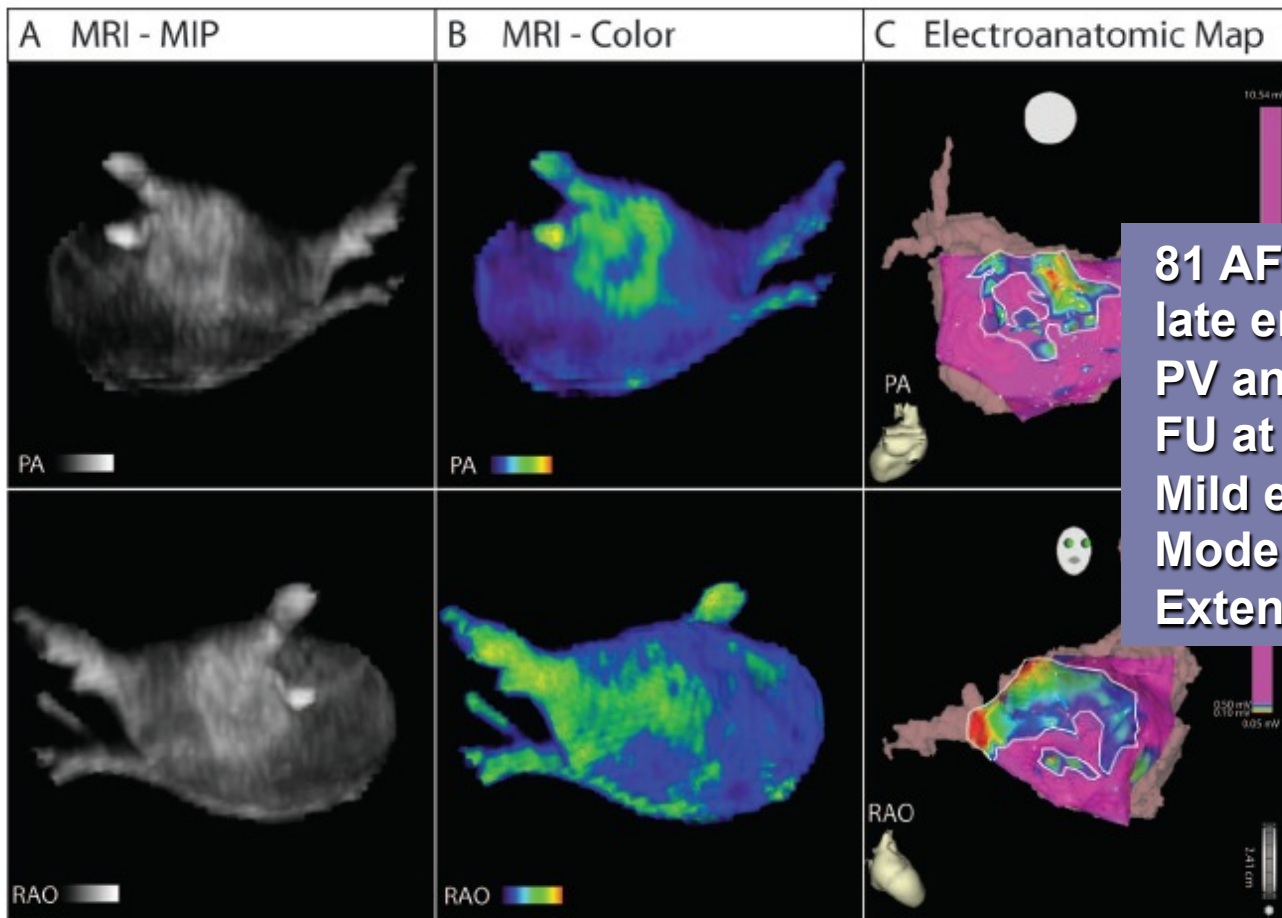


ECHO LA 40x51, LAVI 41cm³/m²
 Volume 110ml
 Mean Bipolar voltage 0,33mV
 MRI UTAH IV



ECHO: LA 47x55, LAVI 66,6cm³/m²
 Volume 195ml
 Mean Bipolar voltage 0,96mV
 MRI UTAH I-II

Noninvasive Assessment of LA Remodelling



81 AF pts, MRI study w.
 late enhancement
 PV antrum isolation
 FU at least 6 months
 Mild enhancement 43 pts
 Moderate enhancement 30 pts
 Extensive enhancement 8 pts

Structural LA Remodelling

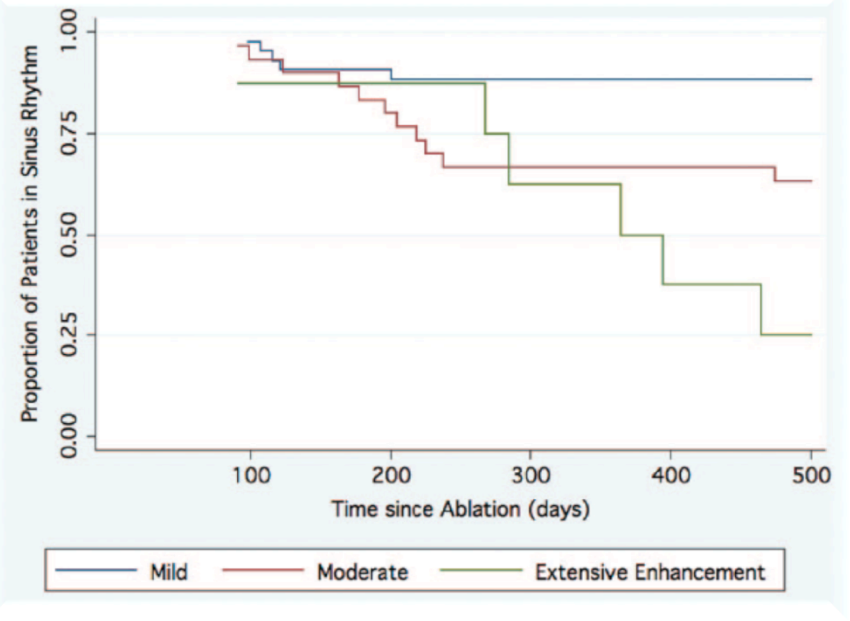


Table 2. Results of Multivariate Analysis

Predictors	Baseline AF Type* (n=81; 40 Paroxysmal, 41 Persistent)			Response to Antiarrhythmic Drug Therapy (n=70; 32 Favorable)			Successful AF Ablation (n=81; 56 Successful)		
	<i>P</i>	Adjusted OR	95% CI	<i>P</i>	Adjusted OR	95% CI	<i>P</i>	Adjusted OR	95% CI
Extent of LA wall enhancement*†	0.01	3.47	1.32–9.16	0.01	3.14	1.32–7.49	<0.01	4.88	1.73–13.74
LA volume‡	<0.01	1.02	1.01–1.04	0.21	0.99	0.97–1.01	0.01	1.02	1.00–1.05
Baseline AF type§	...	...	...	0.96	0.97	0.29–3.19	0.04	0.21	0.05–0.96
Age	0.71	1.01	0.96–1.05	...	...	...	...	...	...

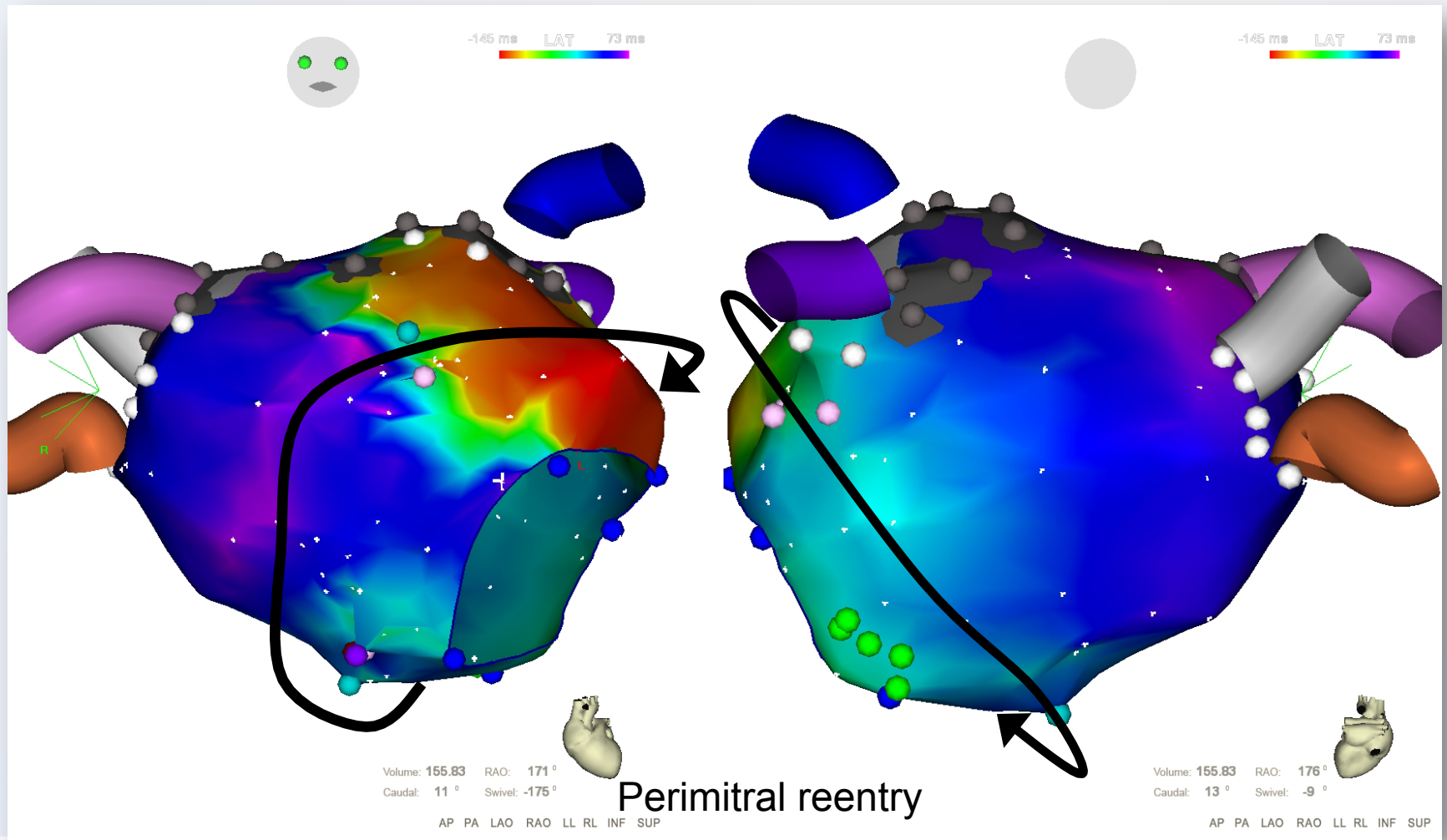
*The baseline AF type calculated was considered paroxysmal or persistent AF.

†The extent of enhancement was entered into analysis as a categorical variable. Patients with mild enhancement showed abnormal enhancement in <15% of the LA wall. Moderate enhancement was considered to be between 15% and 25% abnormal enhancement. Extensive enhancement was considered to be >35% LA wall enhancement.

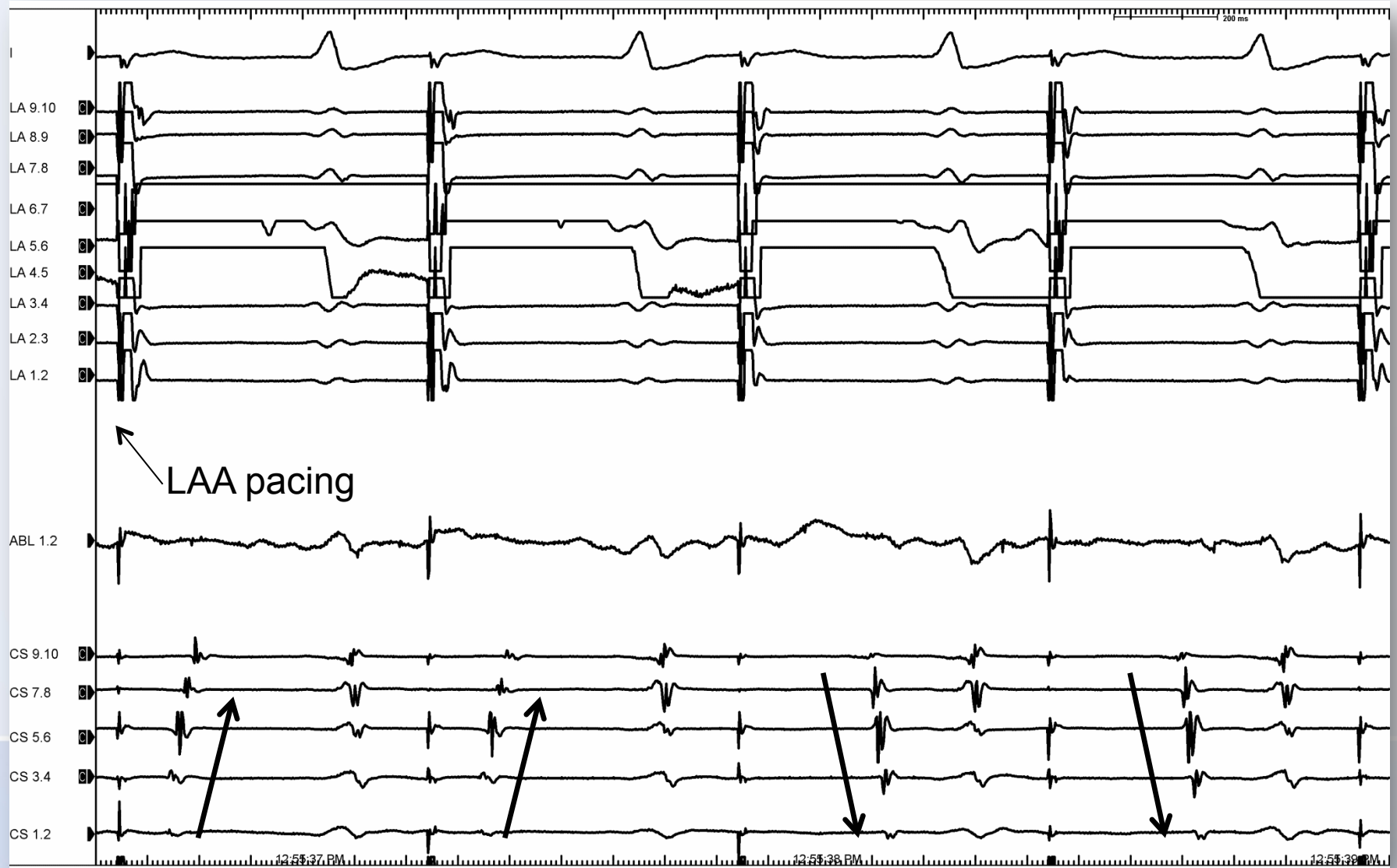
Exemplary Case

- 63-year-old male, 10 years history of AF, first paroxysmal, then persistent
- highly symptomatic AF with rapid response, LV dysfunction (EF 30-40%, EDD 53 mm)
- LA dilatation LA 56x63mm, LAVI 75cm³/m²
- 03/2004 PVI and 07/2004 re-isolation of PVs, SVC and ablation of TC isthmus

Reablation in 2011

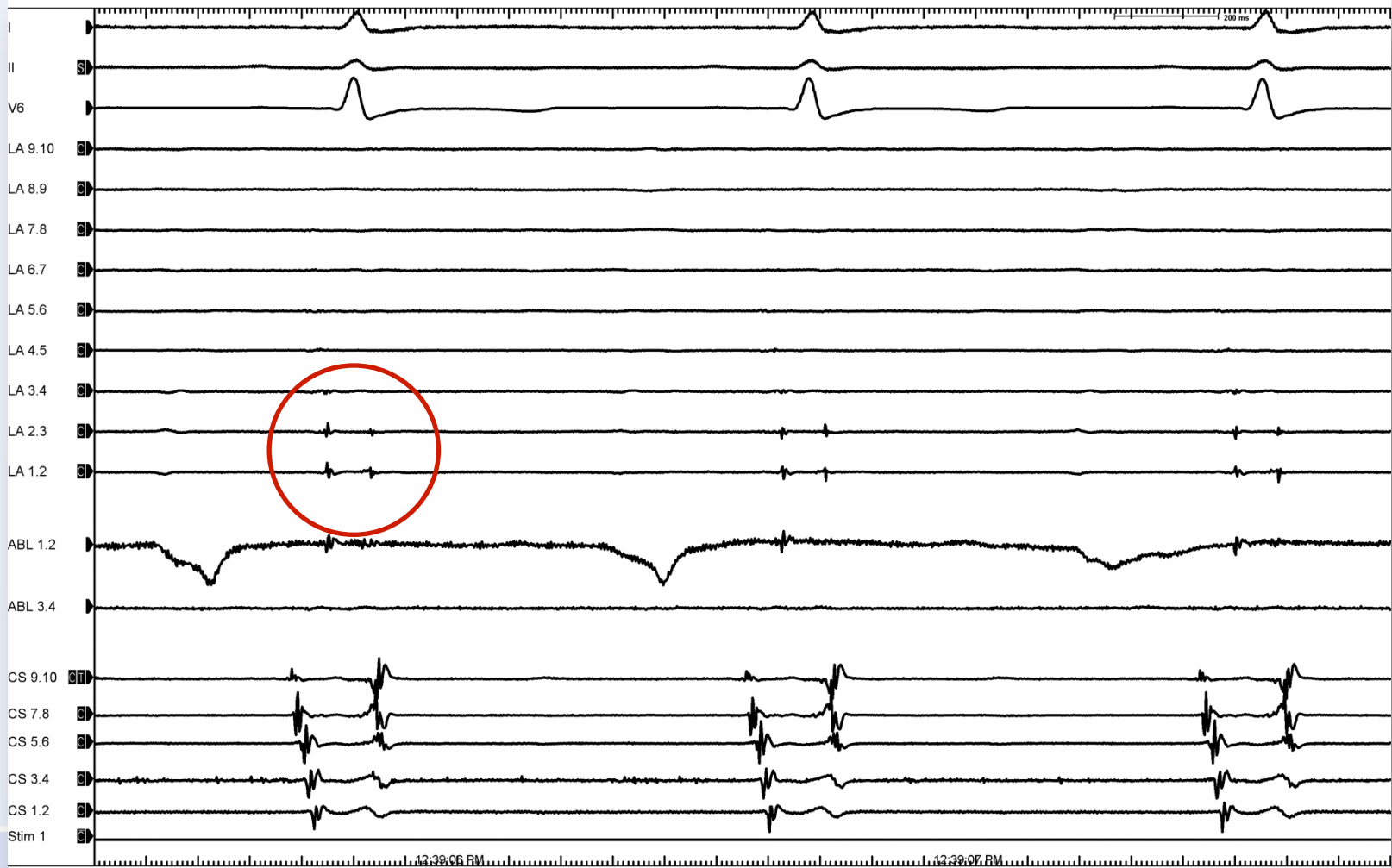


Creation of Block on Mitral Isthmus

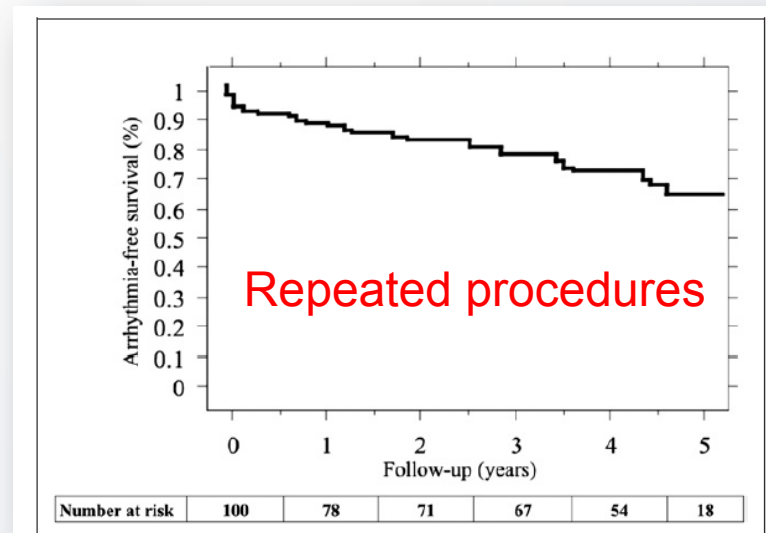
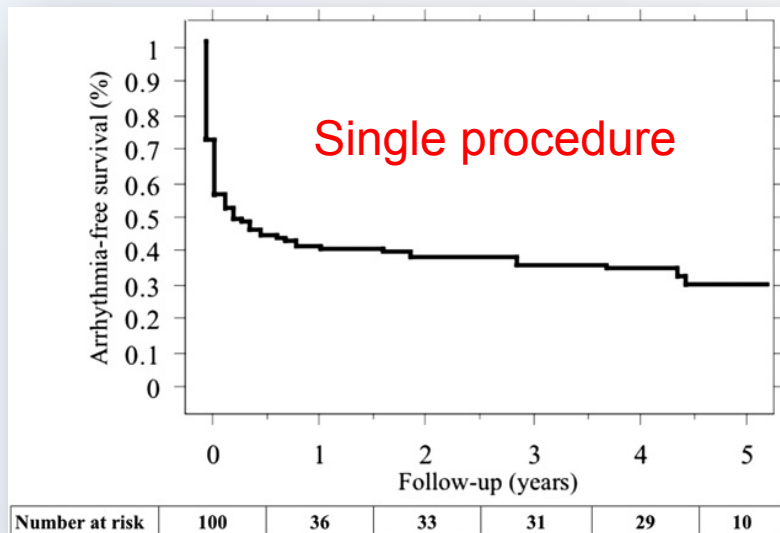


Mind the Gap!

Still PVPs in RIPV despite 2 previous procedures!



Long-Term Outcome after Catheter Ablation

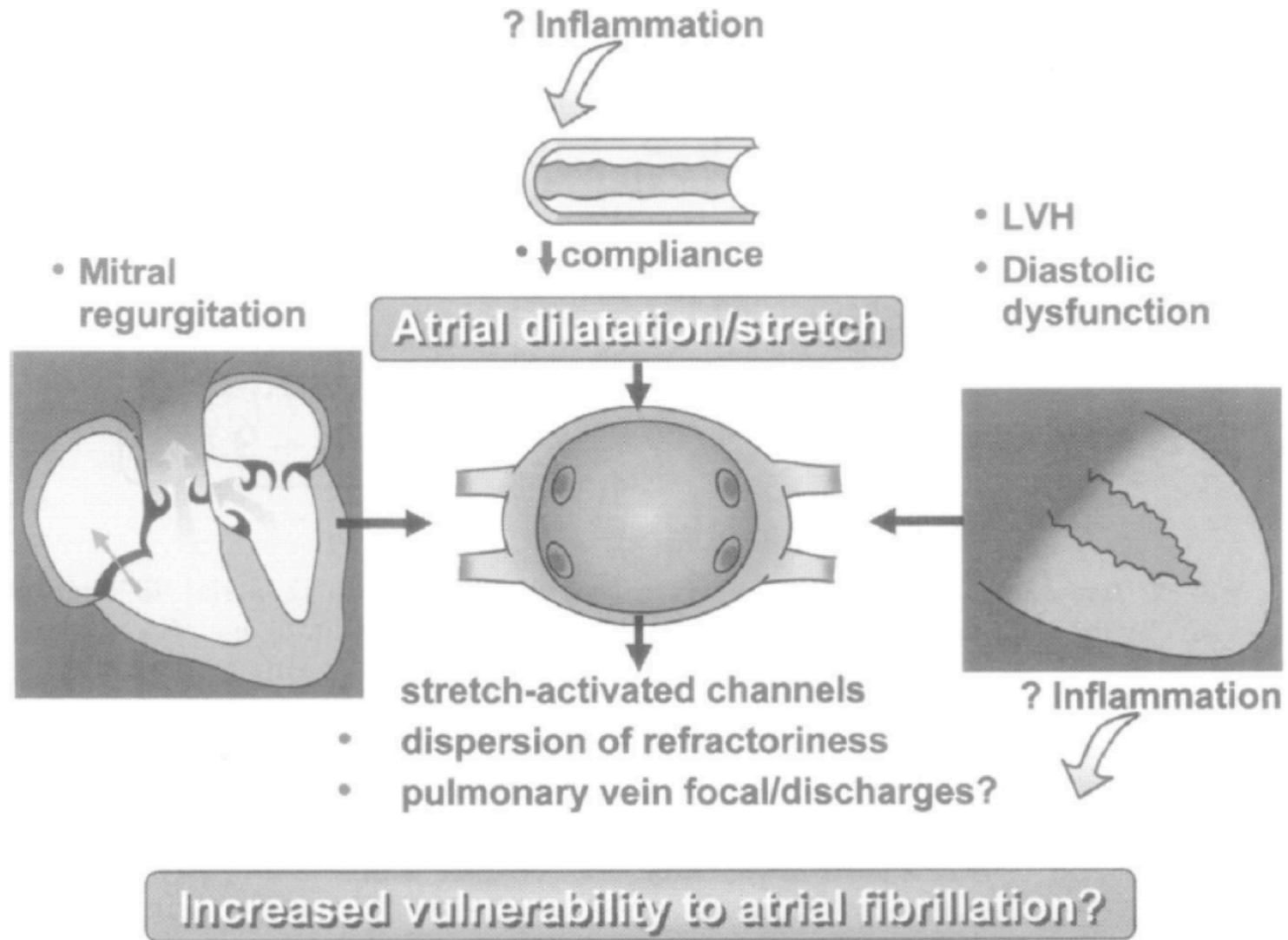


100 pts (86 men, age 55.7±9.6 y), 63 % paroxysmal AF, RF ablation, FU 5 years

Success rate after repeated procedures (median 2) at 1,2 and 5 years: 87, 81 and 63 %

Major complications (tamponade): 3 (3%)

Pathophysiology of Atrial Fibrillation



Cardiovascular Risk Factors Leading to Brain Hypoperfusion and Dementia

