

GIORNATE CARDIOLOGICHE TORINESI

LOGO
AZIENDA OSPEDALIERO-UNIVERSITARIA
Città della Salute e della Scienza di Torino

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2018

Atrial fibrillation and sinus rhythm:
mortality, hospitalization and stroke 15
years after the AFFIRM study

R. De Ponti

Department of Heart & Vessels

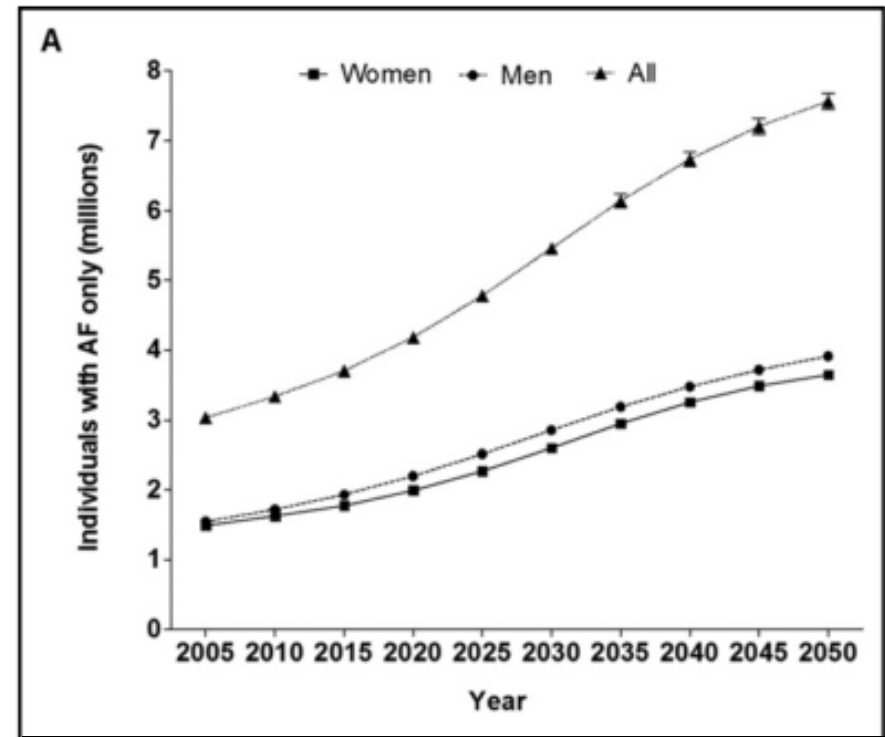
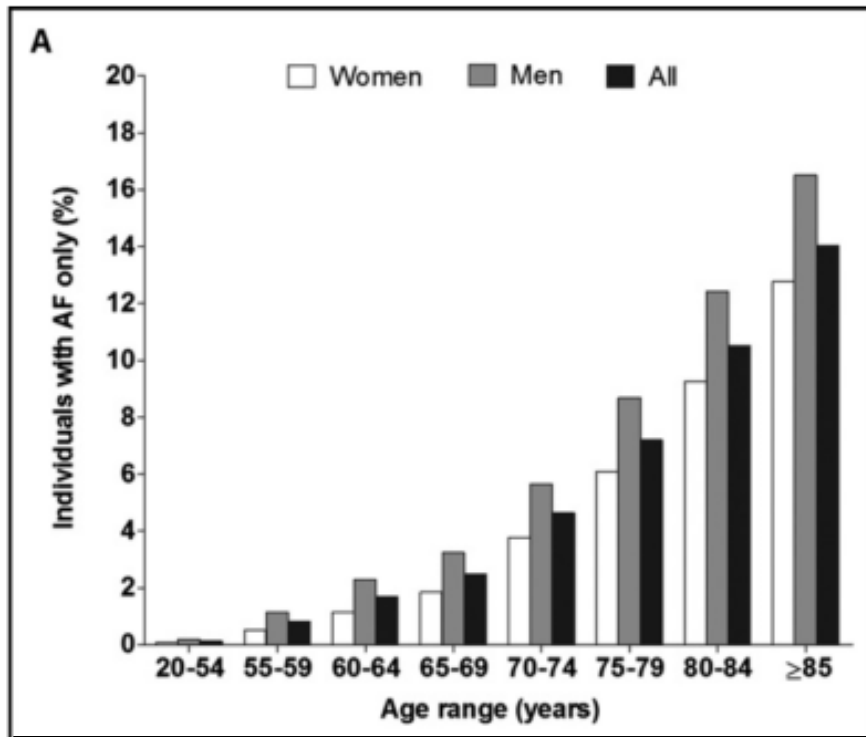
Ospedale di Circolo e Fondazione Macchi
University of Insubria, Varese, Italy



Potenziati conflitti d'interesse

- Biosense Webster, Biotronik: onorari per letture
- Biotronik, Boston Scientific, Biosense Webster, Abbot, Medtronic: grant educazionali

Increasing prevalence of AF and AFL in the US



Naccarelli et al. Am J Cardiol 2009

Italian survey on atrial fibrillation management

Table 1

Frequency of atrial fibrillation (AF) by age and gender

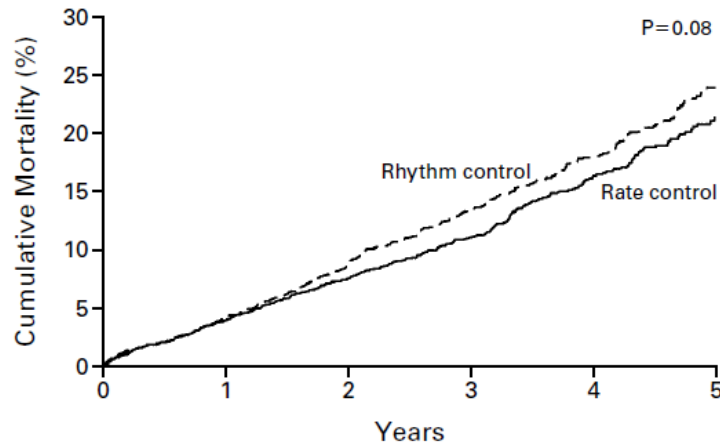
Total frequency: 2.04% (north: 2.4%, centre: 2.1%, south: 1.7%)

Age (yrs)	Study Population (n = 295,906)		AF Population (n = 6,036)		AF Frequency		
	Male	Female	Male	Female	Total	Male	Female
15–50	78,415 (26.5%)	77,823 (26.3%)	183 (3%)	65 (1.1%)	0.16%	0.23%	0.08%
51–65	33,437 (11.3%)	35,213 (11.9%)	527 (8.7%)	340 (5.6%)	1.3%	1.6%	0.97%
66–75	16,867 (5.7%)	19,235 (6.5%)	821 (13.6%)	795 (13.2%)	4.5%	4.9%	4.1%
76–85	10,357 (3.5%)	14,794 (5%)	1,028 (17%)	1,237 (20.5%)	9.0%	9.9%	8.4%
≥86	3,255 (1.1%)	6,510 (2.2%)	397 (12.2%)	643 (9.9%)	10.7%	12.2%	9.9%

Zoni Berisso et al. Am J Cardiol 2013

Comparison of rate control and rhythm control in pts with AF: AFFIRM study

RATE VERSUS RHYTHM CONTROL FOR ATRIAL FIBRILLATION



NO. OF DEATHS	number (percent)					
	0	1	2	3	4	5
Rhythm control	0	80 (4)	175 (9)	257 (13)	314 (18)	352 (24)
Rate control	0	78 (4)	148 (7)	210 (11)	275 (16)	306 (21)

TABLE 3. ADVERSE EVENTS.*

EVENT	OVERALL (N=4060)	RATE-CONTROL GROUP (N=2027)	RHYTHM-CONTROL GROUP (N=2033)	P VALUE
no. of patients (%)				
Primary end point (death)	666 (26.3)	310 (25.9)	356 (26.7)	0.08†
Secondary end point (composite of death, disabling stroke, disabling anoxic encephalopathy, major bleeding, and cardiac arrest)	861 (32.3)	416 (32.7)	445 (32.0)	0.33
Torsade de pointes	14 (0.5)	2 (0.2)‡	12 (0.8)	0.007
Sustained ventricular tachycardia	15 (0.6)	9 (0.7)	6 (0.6)	0.44
Cardiac arrest followed by resuscitation				
Ventricular fibrillation or ventricular tachycardia	19 (0.6)	10 (0.7)	9 (0.5)	0.83
Pulseless electrical activity, bradycardia, or other rhythm	10 (0.3)	1 (<0.1)	9 (0.6)	0.01
Central nervous system event				
Total	211 (8.2)	105 (7.4)	106 (8.9)	0.93
Ischemic stroke§	157 (6.3)	77 (5.5)	80 (7.1)	0.79
After discontinuation of warfarin	69	25	44	
During warfarin but with INR <2.0	44	27	17	
Concurrent atrial fibrillation	67	42	25	
Primary intracerebral hemorrhage	34 (1.2)	18 (1.1)	16 (1.3)	0.73
Subdural or subarachnoid hemorrhage	24 (0.8)	11 (0.8)	13 (0.8)	0.68
Disabling anoxic encephalopathy	9 (0.3)	4 (0.2)	5 (0.4)	0.74
Myocardial infarction	140 (5.5)	67 (4.9)	73 (6.1)	0.60
Hemorrhage not involving the central nervous system	203 (7.3)	107 (7.7)	96 (6.9)	0.44
Systemic embolism	16 (0.5)	9 (0.5)	7 (0.4)	0.62
Pulmonary embolism	8 (0.3)	2 (0.1)	6 (0.5)	0.16
Hospitalization after base line	2594 (76.6)	1220 (73.0)	1374 (80.1)	<0.001

*Percentages were derived from a Kaplan-Meier analysis. P values were derived from the log-rank statistic.

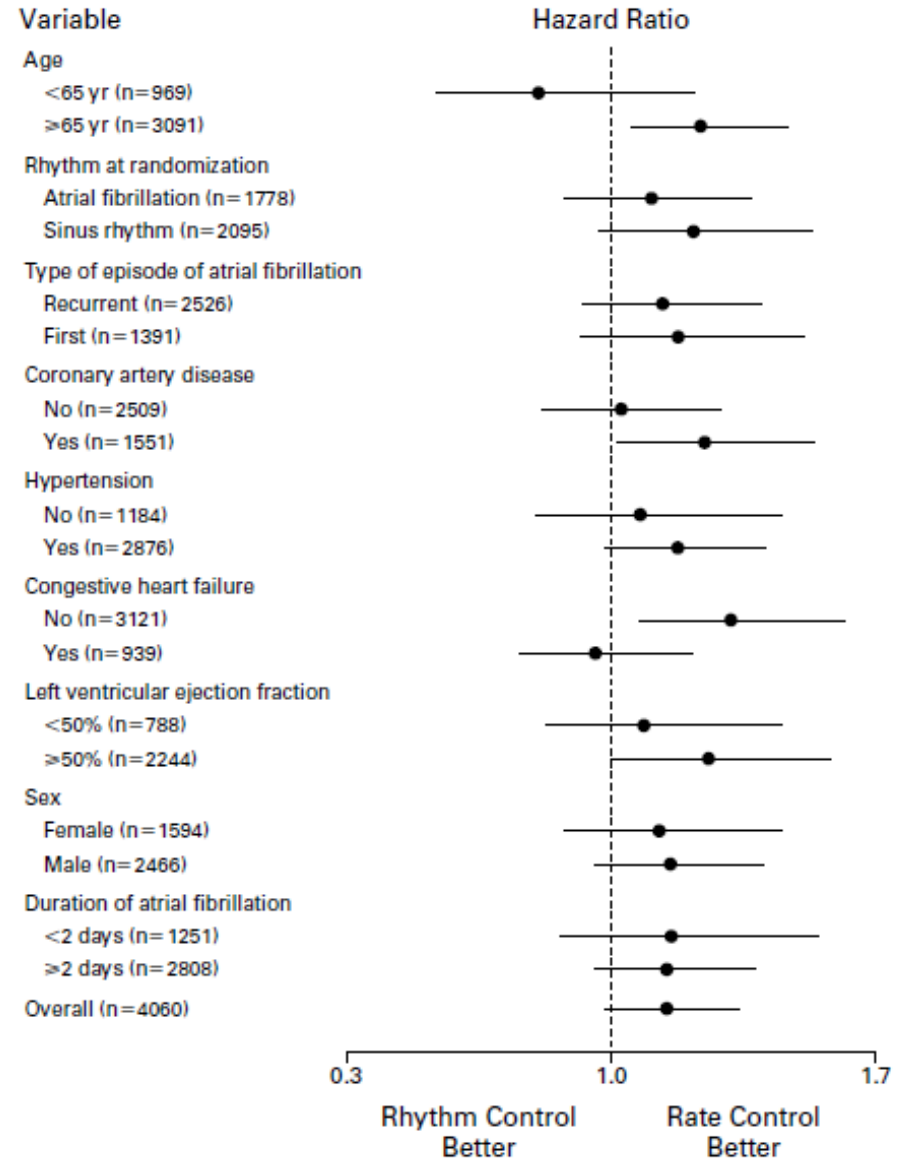
Comparison of rate control and rhythm control in pts with AF: AFFIRM study

TABLE 4. ADDITIONAL ADVERSE EVENTS OR CLINICAL FINDINGS PROMPTING DISCONTINUATION OF A DRUG.*

EVENT	OVERALL (N= 4060)	RATE- CONTROL GROUP (N= 2027)	RHYTHM- CONTROL GROUP (N= 2033)	P VALUE†
	no. of patients (%)			
Congestive heart failure	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 (5.0)	35 (2.1)	127 (8.0)	<0.001
Bradycardia	169 (5.1)	64 (4.2)	105 (6.0)	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 (14.0)	414 (25.4)	<0.001

*Percentages were derived from a Kaplan–Meier analysis.

†P values were based on the log-rank statistic.



Wyse et al. Am NEJM 2002

Relationship between SR, treatment, and survival in the AF follow-up investigation of rhythm management (AFFIRM) study

TABLE 2. Covariates Significantly Associated With Survival Results With Echocardiographic Data Included

Covariate	P	HR	HR: 99% Confidence Limits	
			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

*Per year of age.

Corley et al., Circulation 2004

Rate vs. rhythm control: maintenance of sinus rhythm at the end of the study

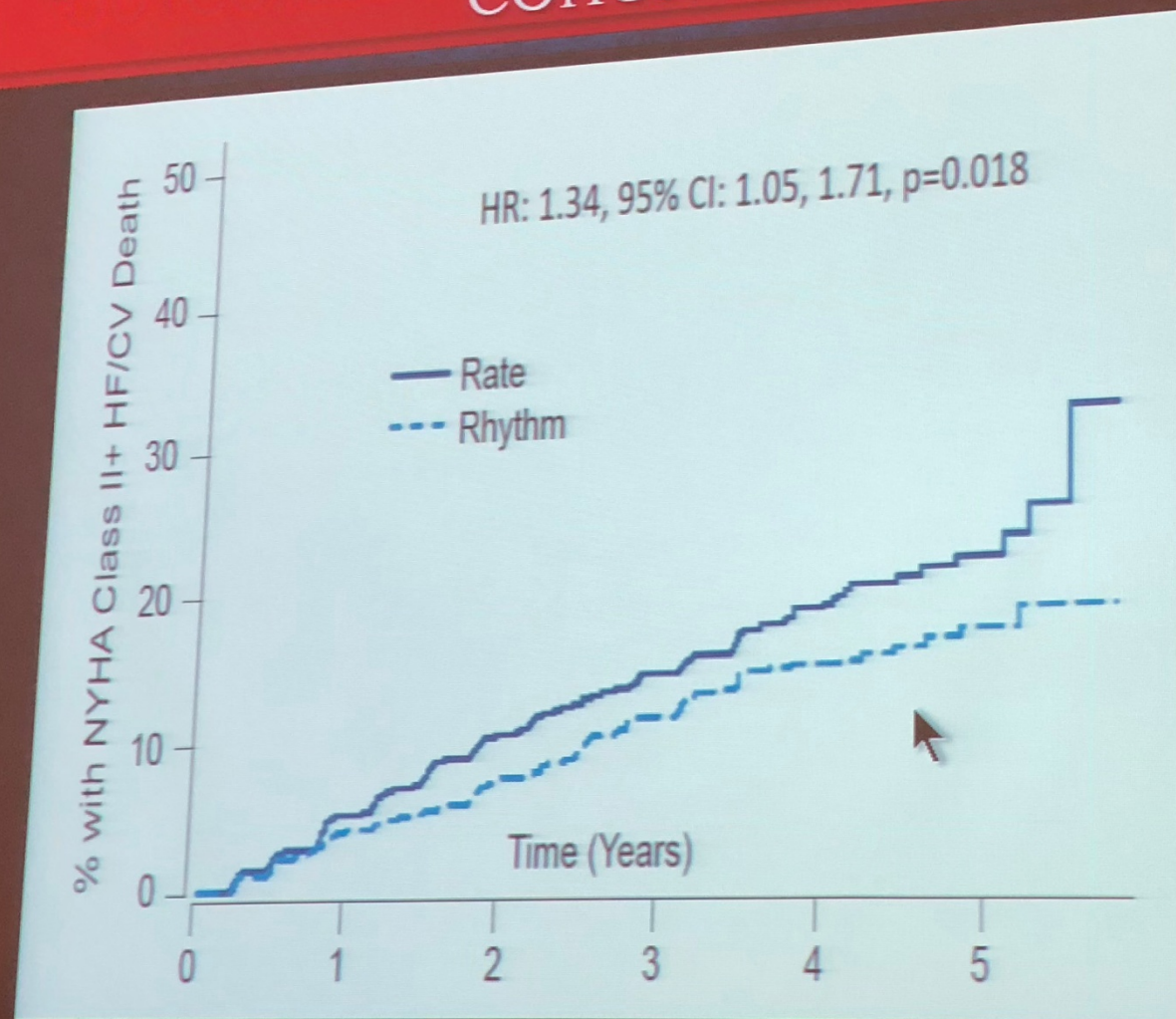
Table 1. Clinical Trials for AF Evaluating Rate Versus Rhythm

Trial	Population	Rate control	Rhythm control	Sinus rhythm at study end
AFFIRM ⁸ (n=4060)	Age > 65 Other stroke risk factors	Digoxin (71%) BB (68%) CCB (46%)	Amiodarone (63%) Sotalol (41%) Propafenone (15%)	Rhythm (63%) Rate (35%)
HOT-CAFE ^{9,10} (n=205)	Persistent AF CCB (8%) Digoxin (43%)	BB (89%) Propafenone (37%) Sotalol (24%)	Amiodarone (57%)	Rhythm (64%) Rate (not specified)
PIAF ¹¹ (n=252)	Persistent AF	BB (9%) Digoxin (7%) CCB (100%)	Amiodarone (100%)	Rhythm (56%) Rate (10%)
RACE ¹² (n=522)	Persistent or recurrent AF/AFL	Not specified	Sotalol (initial agent)	Rhythm (39%) Rate (10%)
STAF ¹³ (n=200)	Persistent AF	BB (45%) CCB (22%) Digoxin (75%)	Amiodarone (42%) Sotalol (22%) Class 1 (12%)	Rhythm (38%) Rate (9%)
AF-CHF ¹⁴ (n=1376)	Persistent AF Ejection Fraction (<35%)	*BB (88%) *Amiodarone (7%) *CCB (3%)	*Amiodarone (82%) *Sotalol (2%) *Dofetilide (<1%)	Rhythm (73%) Rate (30-41%)

*Medication use at 12 months

Abbreviations: BB (beta adrenergic blocker), CCB (calcium channel blocker)

HF DEVELOPMENT IN AF PRINCIPAL OUTCOME IN THE AFFIRM COHORT



SLEE A, SAKSENA S:EUROPEAN SOCIETY OF CARDIOLOGY,
MUNICH, AUGUST 2018

Italian survey on atrial fibrillation management

Table 3

Clinical characteristics stratified by treatment strategy assignment

Characteristic	Rhythm Control (n = 2,643; 43.8%)	Rate Control (n = 3,310; 54.8%)
Age (yrs)		
15–50		
Male	141 (5.3)	36 (1.1)
Female	44 (1.7)	15 (0.5)
51–65		
Male	323 (12.2)	196 (5.9)
Female	204 (7.7)	134 (4.0)
66–75		
Male	406 (15.4)	408 (12.3)
Female	386 (14.6)	393 (11.9)
76–85		
Male	395 (15)	618 (18.7)
Female	469 (17.7)	758 (22.9)
>85		
Male	103 (3.9)	289 (8.7)
Female	172 (6.5)	463 (14)
Heart disease	1,906 (72.1)*	2,623 (79.2)

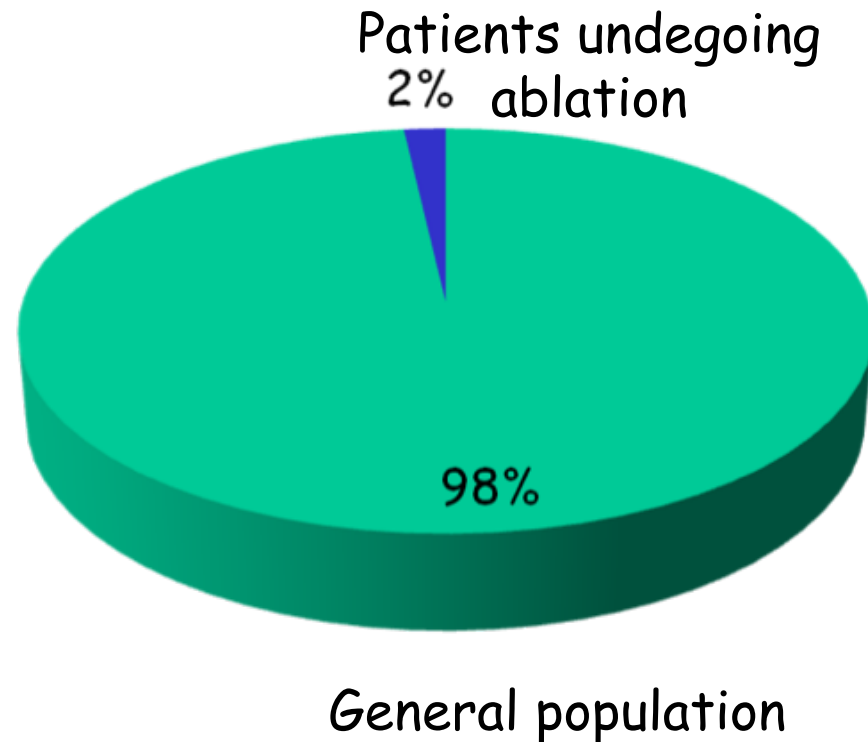
In rhythm
control:
43.1% > 75
yrs

In rate
control:
64.3% > 75
yrs

Italian survey on atrial fibrillation management

Clinical characteristics of patients who underwent catheter ablation of atrial fibrillation substrate (n = 174)

Characteristic	n (%)
Gender	
Male	112 (64.4)
Female	62 (35.6)
Age (yrs)	
16–50	
Male	15 (8.6)
Female	4 (2.3)
51–65	
Male	46 (26.4)
Female	15 (8.6)
66–75	
Male	34 (19.5)
Female	25 (8.6)
>75	
Male	17 (9.8)
Female	18 (10.3)
Atrial fibrillation type	
Paroxysmal	34 (19.5)
Persistent	140 (80.5)
Heart disease	97 (55.7)
Previous cardioversion	
0	24 (13.8)
1–3	90 (51.7)
>3	52 (29.9)
Unknown	8 (4.6)
Symptoms leading to ablation	
Palpitations	144 (82.8)
Dyspnea	83 (47.7)
Asthenia	90 (51.7)
Other	3 (9.8)
Catheter ablation	
1	117 (67.2)
2	40 (23)
≥3	6 (3.4)
Unknown	11 (6.3)
Postablation antiarrhythmic drugs	
Propafenone	20 (11.5)
Flecainide	41 (23.6)
Amiodarone-dronedaron	46 (24.4)
Combinations	11 (6.3)
None	56 (32.2)
Postablation antithrombotic therapy	
No	40 (23)
Antiplatelet agents	38 (21.8)
Oral anticoagulation	96 (55.2)



Management of atrial fibrillation in the emergency room and in the cardiology ward: the BLITZ AF study

Michele Massimo Gulizia^{1,2*}, Roberto Cemin³, Furio Colivicchi⁴, Leonardo De Luca⁵, Andrea Di Lenarda⁶, Giuseppe Boriani⁷, Giuseppe Di Pasquale⁸, Federico Nardi⁹, Marino Scherillo¹⁰, Donata Lucci², Gianna Fabbri², and Aldo Pietro Maggioni², on behalf of BLITZ-AF Investigators[†]

Aims

To assess the number of admissions to the emergency room (ER) of patients with atrial fibrillation (AF) or atrial flutter (af) and their subsequent management. To evaluate the clinical profile and the use of antithrombotics and antiarrhythmic therapy in patients with AF admitted to cardiology wards.

Methods and results

BLITZ-AF is a multicentre, observational study conducted in 154 centres on patients with AF/af. In each centre, data were collected, retrospectively for 4 weeks in ER and prospectively for 12 weeks in cardiology wards. In ER, there were 6275 admissions. Atrial fibrillation was the main diagnosis in 52.9% of the cases, af in 5.9%. Atrial fibrillation represented 1.0% of all ER admissions and 1.7% of all hospital admissions. A cardioversion has been performed in nearly 25% of the cases. Out of 4126 patients, 52.2% were admitted in cardiology ward; mean age was 74 ± 11 years, 41% were females. Patients with non-valvular AF were 3848 (93.3%); CHA₂DS₂-VASc score was ≥ 2 in 87.4%. Cardioversion was attempted in 38.8% of the patients. **In-hospital mortality was 1.2%. At discharge, 42.6% of the patients were treated with vitamin K antagonists, 39.5% with direct oral anticoagulants, 13.6% with other antithrombotic drugs, and 4.2% did not take any antithrombotic agent. Rate control strategy was pursued in 47.2%, rhythm control in 44.0%, 45.6% were discharged in sinus rhythm.**

Conclusion

Atrial fibrillation still represents a significant burden on health care system. Oral anticoagulant use increased over time even if compliance with guidelines, with respect to prevention of the risk of stroke, remains suboptimal.

Management of AF: the BLITZ - AF

Table 1 Burden of atrial fibrillation/atrial flutter in the ER

	No of medical accesses in the ER	Hospital admissions	%
Total	364 134	60 332	16.6
For AF/af	3689	1024	27.8
%	1.0	1.7	

Table 4 Discharge

	Total (n = 4126)
In hospital events, n (%)	
Ischaemic stroke	14 (0.3)
TIA	6 (0.2)
Haemorrhagic stroke	4 (0.1)
Peripheral embolism	8 (0.2)
Pulmonary embolism	10 (0.2)
Major bleeding	23 (0.6)
Heart failure	319 (7.7)
Acute coronary syndrome	95 (2.3)
Atrial fibrillation recurrence	111 (2.7)
Other CV events	131 (3.2)
Other non-CV events	112 (2.7)
Deaths, n (%)	48 (1.2)
Ischaemic stroke	1 (2.1)
Haemorrhagic stroke	1 (2.1)
Heart failure	25 (52.1)
ACS	3 (6.3)
Other, CV	8 (16.7)
Other, non-CV	10 (20.8)

Table 3 Atrial fibrillation management

	Total (n = 4126)
Transthoracic echo, n (%)	3314 (80.3)
Transoesophageal echo, n (%)	673 (16.3)
Coronary angiography, n (%)	514 (12.5)
Coronary revascularization, n (%)	153 (3.7)
24 h Holter monitoring, n (%)	576 (14.0)
Electrophysiological study, n (%)	141 (3.4)
Cardioversion performed, n (%) ^a	1599 (38.8)
Electrical cardioversion, n (%) ^a	1000 (24.2)
Transthoracic	988 (98.8)
Transoesophageal	5 (0.5)
Internal, n (%)	8 (0.8)
Pharmacological cardioversion, n (%) ^a	674 (16.3)
Cardioversion planned, n (%) ^a	111 (2.7)
Electrical	107 (96.4)
Pharmacological	5 (4.5)
Ablation performed, n (%)	185 (4.5)
A-V node	27 (14.6)
Pulmonary vein	158 (85.4)
Ablation planned, n (%)	33 (0.8)
Device implant, n (%)	495 (12.0)
Left atrial appendage occlusion, n (%)	27 (0.7)

In-hospital mortality in patients with atrial arrhythmias: the German experience

LA ablation in 21744/161502 pts (13.5%) increased over time

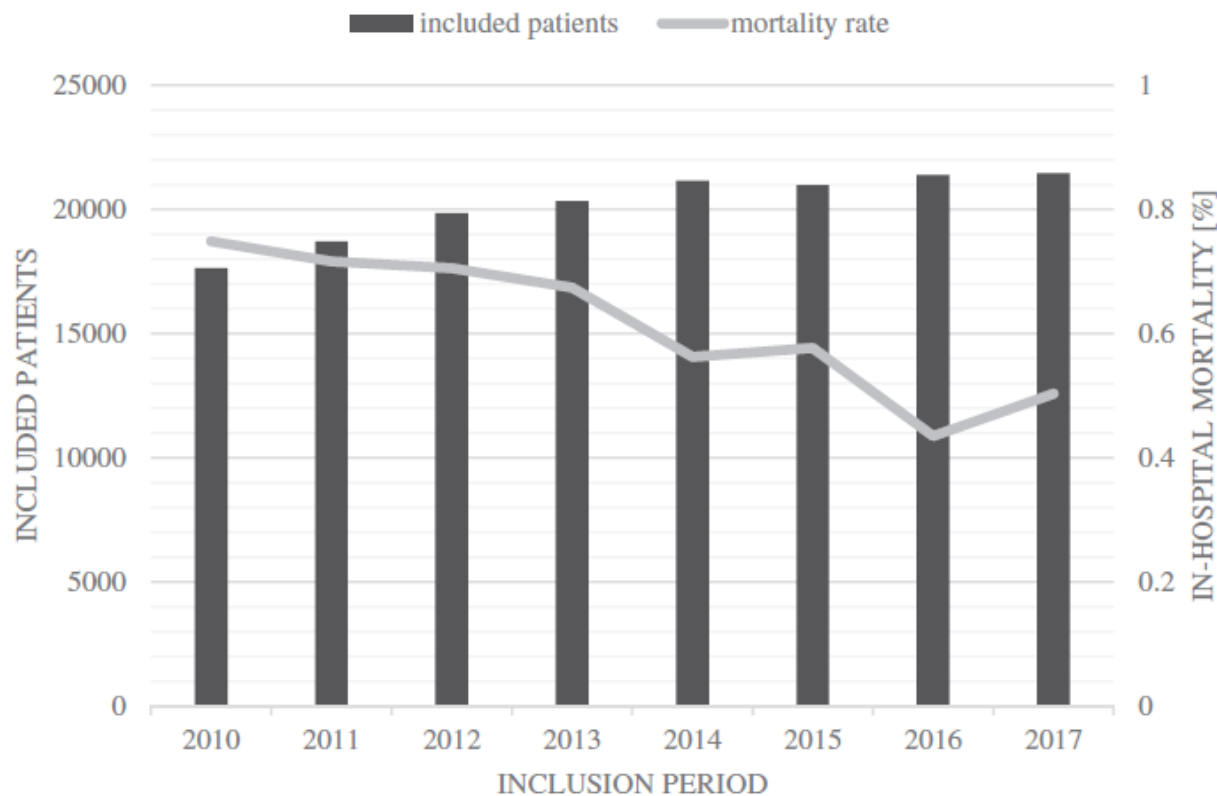


Figure 1 Numbers of included patients and mortality rates per year.

In-hospital mortality in patients with atrial arrhythmias: the German experience

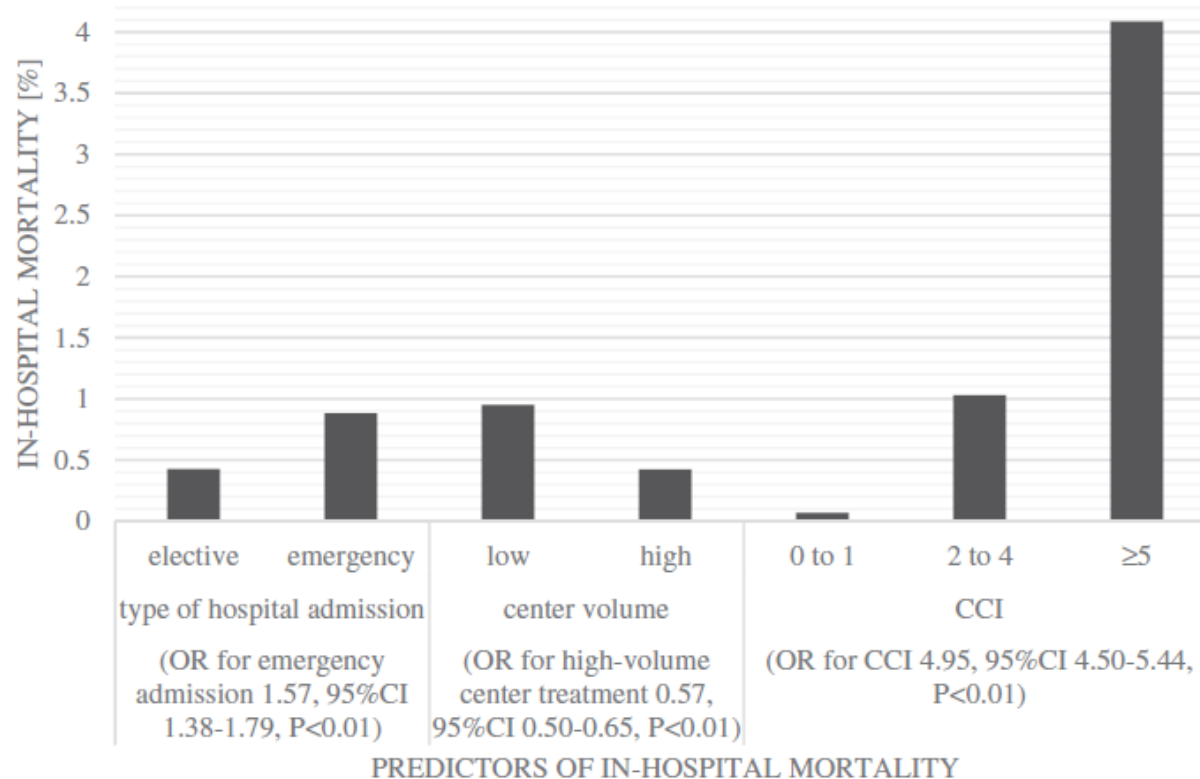


Figure 2 In-hospital mortality rates of the total study cohort in dependence of the way of hospital admission, centre volume, and Charlson Comorbidity Index.

Lifetime pattern of AF and the risk of stroke and death in a population-based cohort of men (from the Manitoba Follow-Up Study)

Risk of stroke by pattern of atrial fibrillation

	Age-adjusted			Adjusted*			Interaction Model					
							No Antithrombotic*, [†]			Antithrombotic*, [†]		
	HR	95%CI	P	HR	95%CI	P	HR	95%CI	P	HR	95%CI	P
<i>Free of AF</i>	1.00	Ref.		1.00	Ref.		1.00	Ref.		1.71	1.46-2.00	<0.0001
<i>Newly diagnosed AF</i>	1.85	1.19-2.88	0.006	1.71	1.10-2.66	0.02	1.96	1.07-3.58	0.03	0.74	0.31-1.78	0.50
<i>Intermittent AF – In Sinus</i>	1.35	0.95-1.92	0.09	1.02	0.72-1.45	0.9	1.77	1.10-2.84	0.02	0.38	0.19-0.75	0.006
<i>Intermittent AF – In AF</i>	1.07	0.34-3.32	0.9	0.68	0.22-2.13	0.5		<i>n/e</i> [‡]			<i>n/e</i> [‡]	
<i>Sustained AF</i>	2.20	1.58-3.06	<0.0001	1.85	1.33-2.59	0.0003	2.49	1.57-3.97	<0.0001	0.57	0.30-1.10	0.09
<i>Antithrombotic therapy</i> [†]		N/A		1.58	1.37-1.85	<0.0001		N/A		N/A		

N/A = Not applicable.

* Adjusted for Age, Heart failure, Diabetes mellitus, Antihypertensive therapy, Cancer, Smoking.

[†] Antithrombotic therapy = Antiplatelet or anticoagulant.

[‡] n/e = not estimable due to insufficient event counts.

More atrial fibrillation more risk !!

Risk of death by pattern of atrial fibrillation

	Age-adjusted			Adjusted*			Interaction Model					
							No Antithrombotic*, [†]			Antithrombotic*, [†]		
	HR	95%CI	P	HR	95%CI	P	HR	95%CI	P	HR	95%CI	P
<i>Free of AF</i>	1.00	Ref.	-	1.00	Ref.	-	1.00	Ref.	-	0.52	0.47-0.58	<0.0001
<i>Newly diagnosed AF</i>	1.92	1.55-2.38	<0.0001	2.03	1.64-2.52	<0.0001	1.87	1.44-2.41	<0.0001	1.37	0.87-2.18	0.2
<i>Intermittent AF – In Sinus</i>	1.46	1.24-1.73	<0.0001	1.71	1.44-2.03	<0.0001	1.52	1.21-1.93	0.0005	1.31	0.93-1.85	0.1
<i>Intermittent AF – In AF</i>	1.90	1.25-2.90	0.003	2.41	1.58-3.68	<0.0001	2.61	1.48-4.61	0.0009	0.87	0.37-2.03	0.8
<i>Sustained AF</i>	2.08	1.78-2.44	<0.0001	2.48	2.11-2.92	<0.0001	2.40	1.95-2.94	<0.0001	1.12	0.81-1.54	0.5
<i>Antithrombotic therapy</i> [†]		N/A		0.55	0.49-0.60	<0.0001		N/A		N/A		

N/A = Not Applicable.

* Adjusted for Age, Heart Failure, Diabetes Mellitus, Antihypertensive therapy, Cancer, Smoking, Ischemic Heart Disease.

[†] Antithrombotic therapy = Antiplatelet or anticoagulant.

McIntire et al. Am J Cardiol 2018

Drivers of hospitalisation trends for non-valvular atrial fibrillation in Western Australia, 2000–2013

Courtney Weber^{a,*}, Joseph Hung^b, Siobhan Hickling^a, Ian Li^a, Brendan McQuillan^b, Tom Briffa^a

^a School of Population and Global Health, The University of Western Australia, Crawley, Western Australia, Australia

^b School of Medicine and Pharmacology, Sir Charles Gairdner Hospital Unit, The University of Western Australia, Crawley, Western Australia, Australia

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ABSTRACT

Objective: To determine if increasing hospitalisations for non-valvular atrial fibrillation (NVAf) in Western Australia (WA) was due to incident (first-ever) or repeat hospitalisations, an ageing population structure, changing procedural practice or a combination of these factors.

Methods: We conducted a longitudinal retrospective population study on all WA residents aged 25–94 years between 2000 and 2013, with a principal hospital discharge diagnosis of NVAf. Person-linked hospital morbidity and mortality records were used to measure annual rate ratios (RRs) and 95% confidence intervals (CIs) in the total and incident NVAf (25–94 years) hospitalisations, further stratified by sex and by age-specific standardised groups (25–44, 45–64, 65–75, 75–84, 85–94 years).

Results: There were 55,532 total hospitalisations for NVAf between 2000 and 2013, patient mean age 68.3 years, and 58% male. Annual age- and sex- standardised rates for total NVAf hospitalisation increased by 3.0%/year (RR 1.030; 95%CI; 1.028, 1.038), and in both men and women. The largest absolute increase in hospitalisation rate occurred in those aged 85–94 years ($\Delta 613/100,000$ men and women combined). Incident NVAf hospitalisations showed a borderline decline of 0.5%/year (RR 0.99; 95%CI; 0.99, 1.0) with a statistically significant trend in women but not men. The rate of AF admissions associated with a catheter ablation increased by 13%/year (95%CI; 13.1%, 15.3%).

Conclusion: The increasing rates of total hospitalisation for NVAf is driven more by repeat than incident admissions, escalating hospitalisations in the very elderly, and more frequent interventional procedures. These drivers have major economic and healthcare planning implications.

One-year risks of stroke and mortality in patients with atrial fibrillation from different clinical settings: The Gulf SAFE registry and Darlington AF registry

Yan-Guang Li^{a,b}, Kazuo Miyazawa^a, Andreas Wolff^c, Mohammad Zubaid^d, Alawi A. Alsheikh-Ali^e,

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ABSTRACT

Background: Differences exist in oral anticoagulation (OAC) use between different populations with atrial fibrillation (AF), which may be associated with varying outcomes.

Purpose: We aimed to provide patient level comparisons of two cohorts of patients with AF, from the United Kingdom (UK) and Middle East (ME).

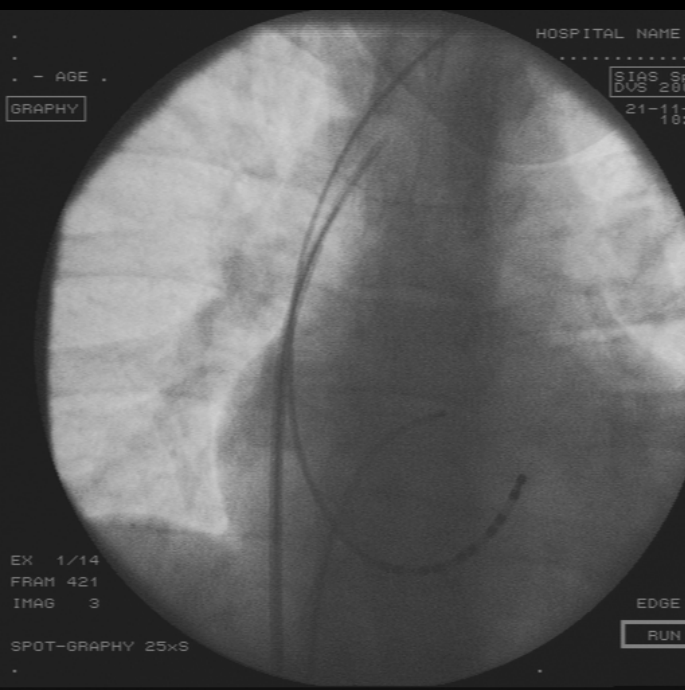
Methods: The clinical characteristics, prescription of OAC, one-year risk of stroke and mortality were compared between individual patients with AF included into the Darlington AF registry (UK, $n = 2258$) and the Gulf SAFE (Survey of atrial fibrillation events) registry (ME, $n = 1740$).

Results: A high percentage of patients from the Darlington registry were candidates for OAC (i.e., CHA₂DS₂-VASC score ≥ 2 in males or ≥ 3 in females; 82.0% in Darlington and 57.1% in Gulf SAFE). OAC use was suboptimal (52.0% in Darlington vs 58.4% in Gulf SAFE).

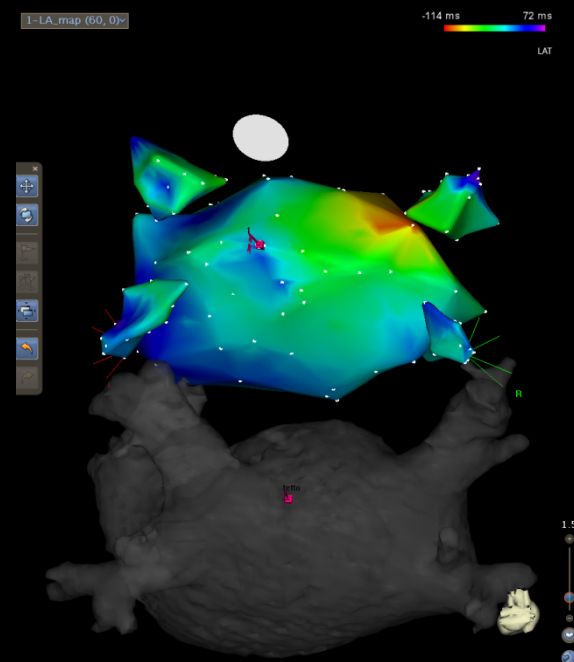
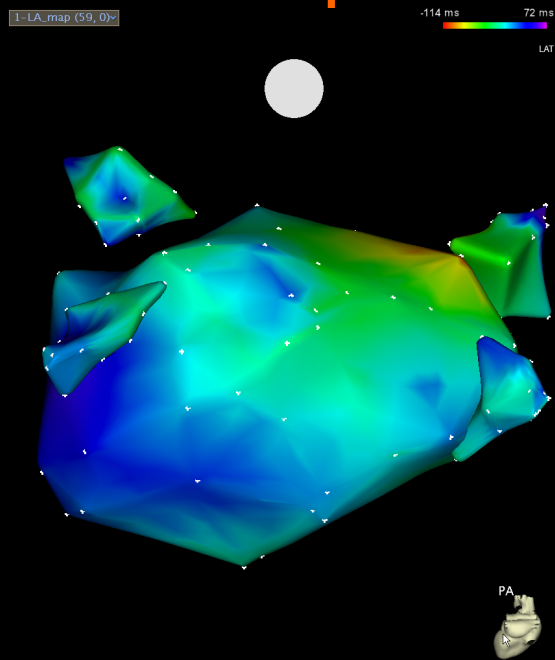
One-year rates of stroke and mortality were high in both populations, especially in those with CHA₂DS₂-VASC score ≥ 2 in males and ≥ 3 in females (Darlington vs. Gulf SAFE: 3.51% vs. 5.63 for stroke; 11.4% vs. 16.8% for mortality). On multivariate analyses, female sex and previous stroke were independently associated with stroke events; while elderly age, female sex, vascular disease and heart failure were independent risk factors for mortality (all $p < 0.05$). Patients from Gulf SAFE registry had higher risk of stroke (odds ratio, 2.18 [1.47–3.23]) and mortality (odds ratio, 1.67 [1.31–2.14]) compared with those from Darlington registry. The CHA₂DS₂-VASC score showed good discrimination in predicting one-year risk of stroke (area under curve, 0.71 [0.65–0.76] in non-anticoagulated patients) and mortality (area under curve, 0.70 [0.68–0.72]) in the whole study population, as well as in Darlington or Gulf SAFE registry separately.

Conclusions: Stroke prevention was generally suboptimal in patient cohorts from the two registries, which was associated with high one-year risks of stroke and mortality, particularly so among patients from the Gulf SAFE registry. The higher risks for stroke and mortality in AF patients from the Gulf SAFE registry (compared to a UK cohort) merit further implementation of cardiovascular prevention strategies.

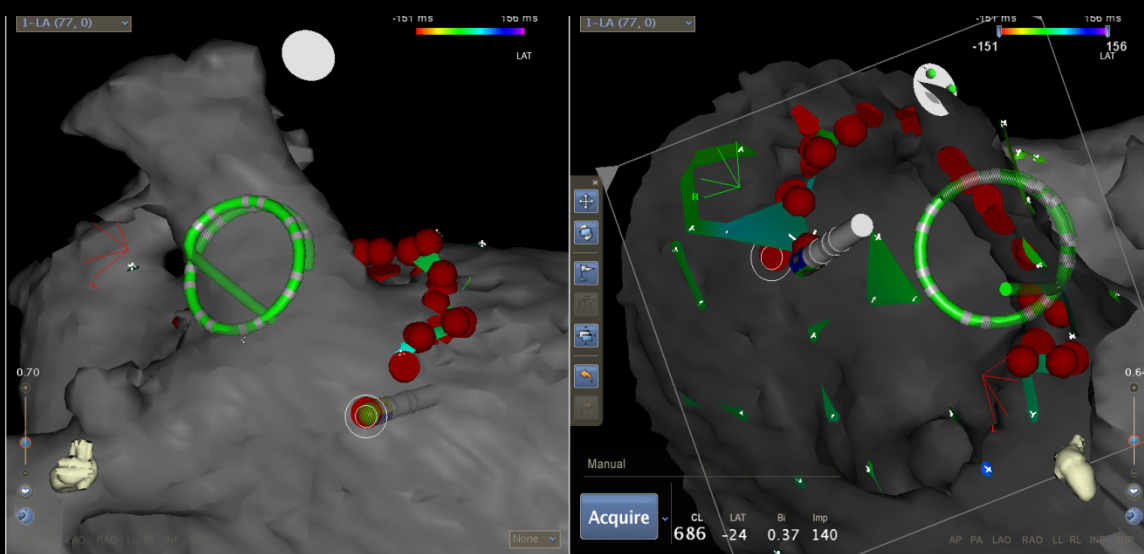
1. Access



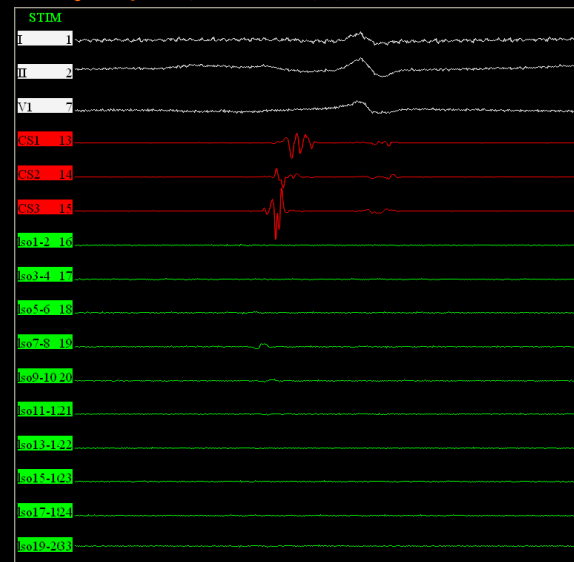
2. Map



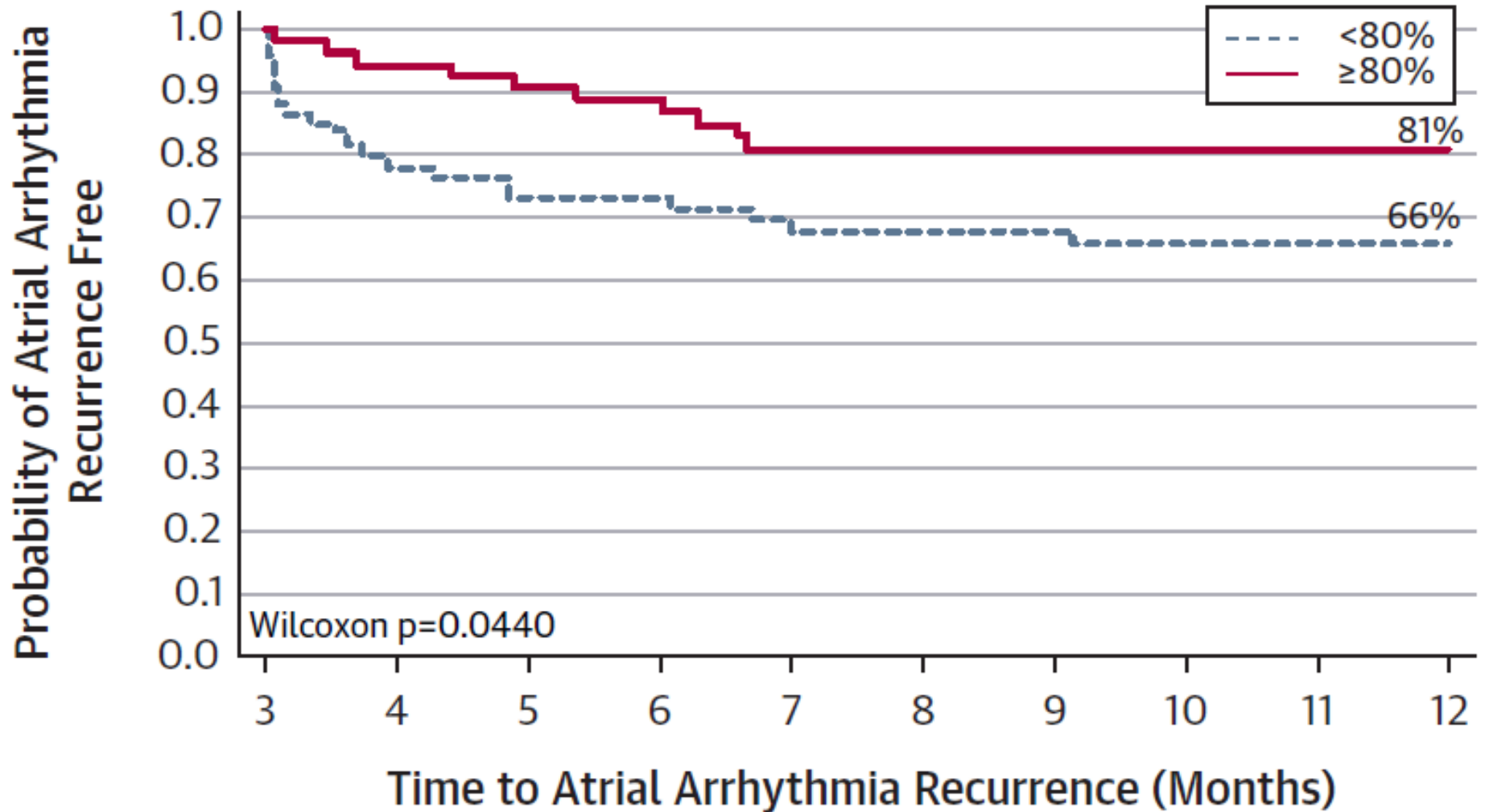
3. Ablate



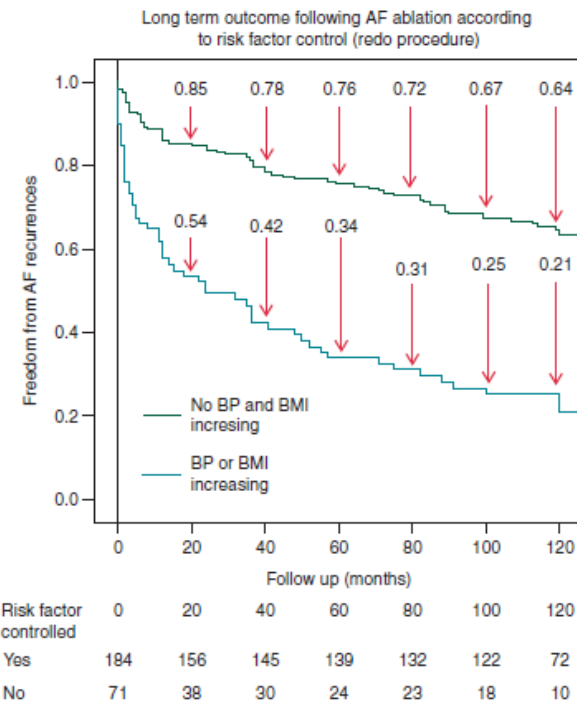
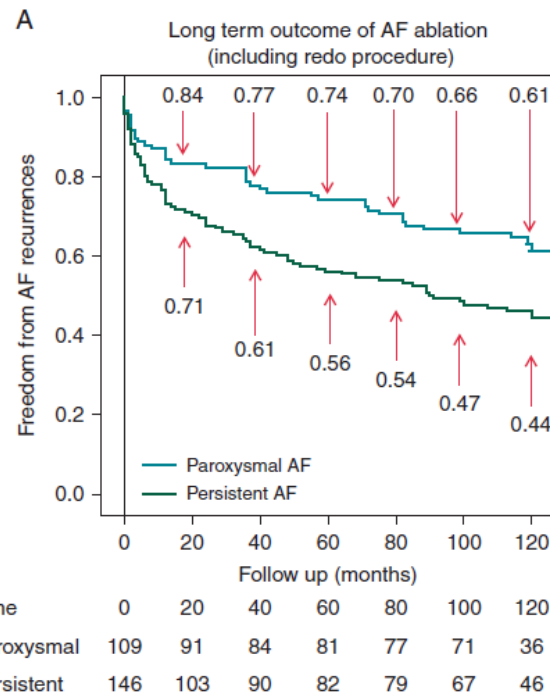
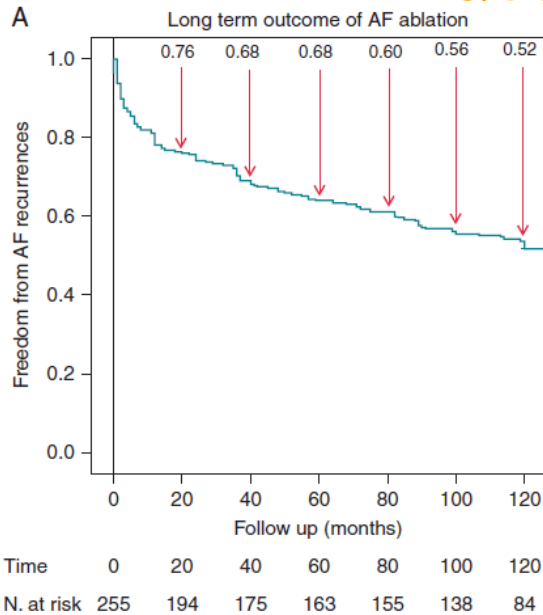
4. Validate



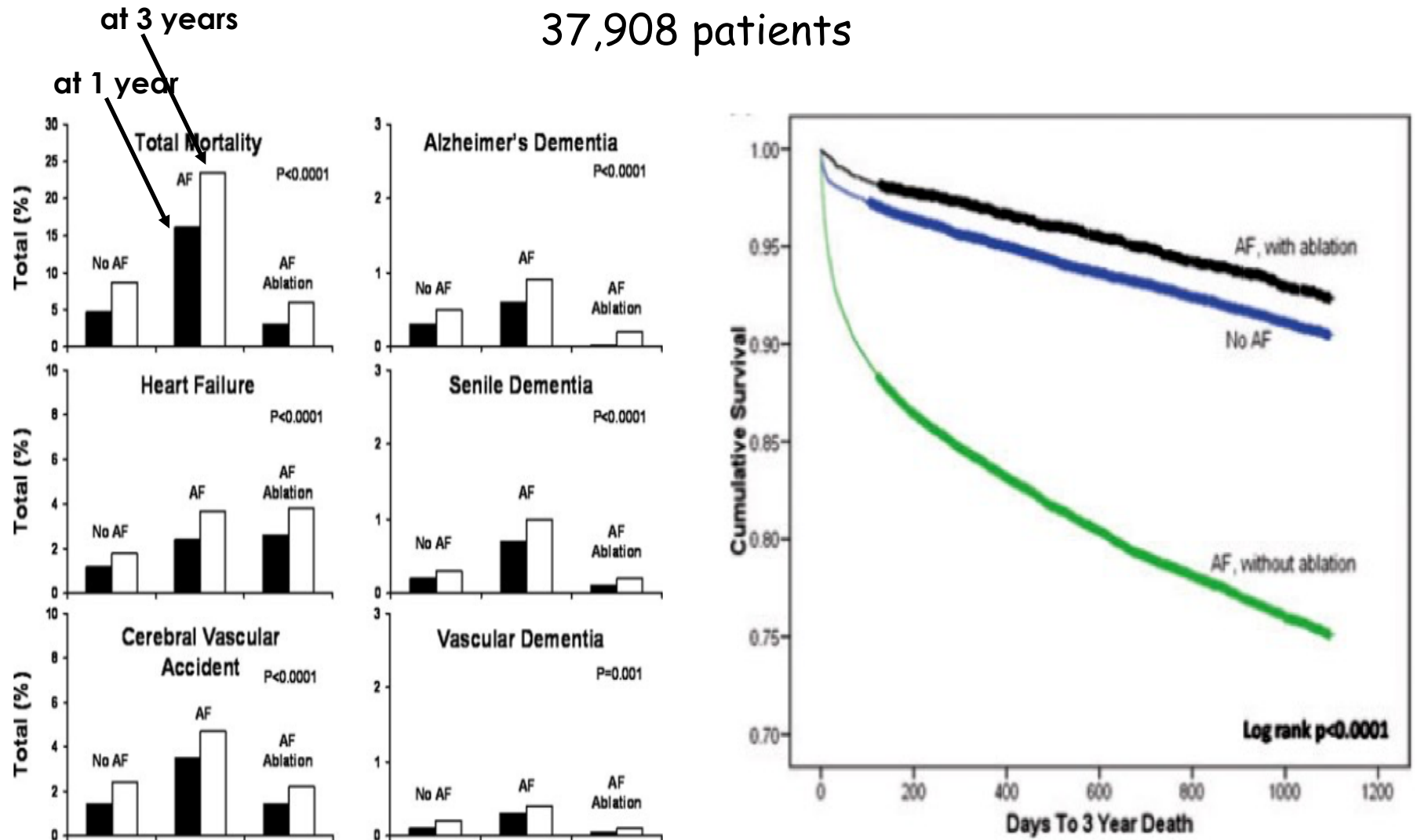
Paroxysmal AF catheter ablation with a CFS catheter: results of the prospective, multicenter SMART-AF trial



Very long-term outcome following transcatheter ablation of atrial fibrillation



Patients treated with CA for AF have long-term rates of death, stroke, and dementia similar to patients without AF



Bunch et al., J Cardiovasc Electrophysiol 2011

Health Outcomes With Catheter Ablation or Antiarrhythmic Drug Therapy in Atrial Fibrillation

Results of a Propensity-Matched Analysis

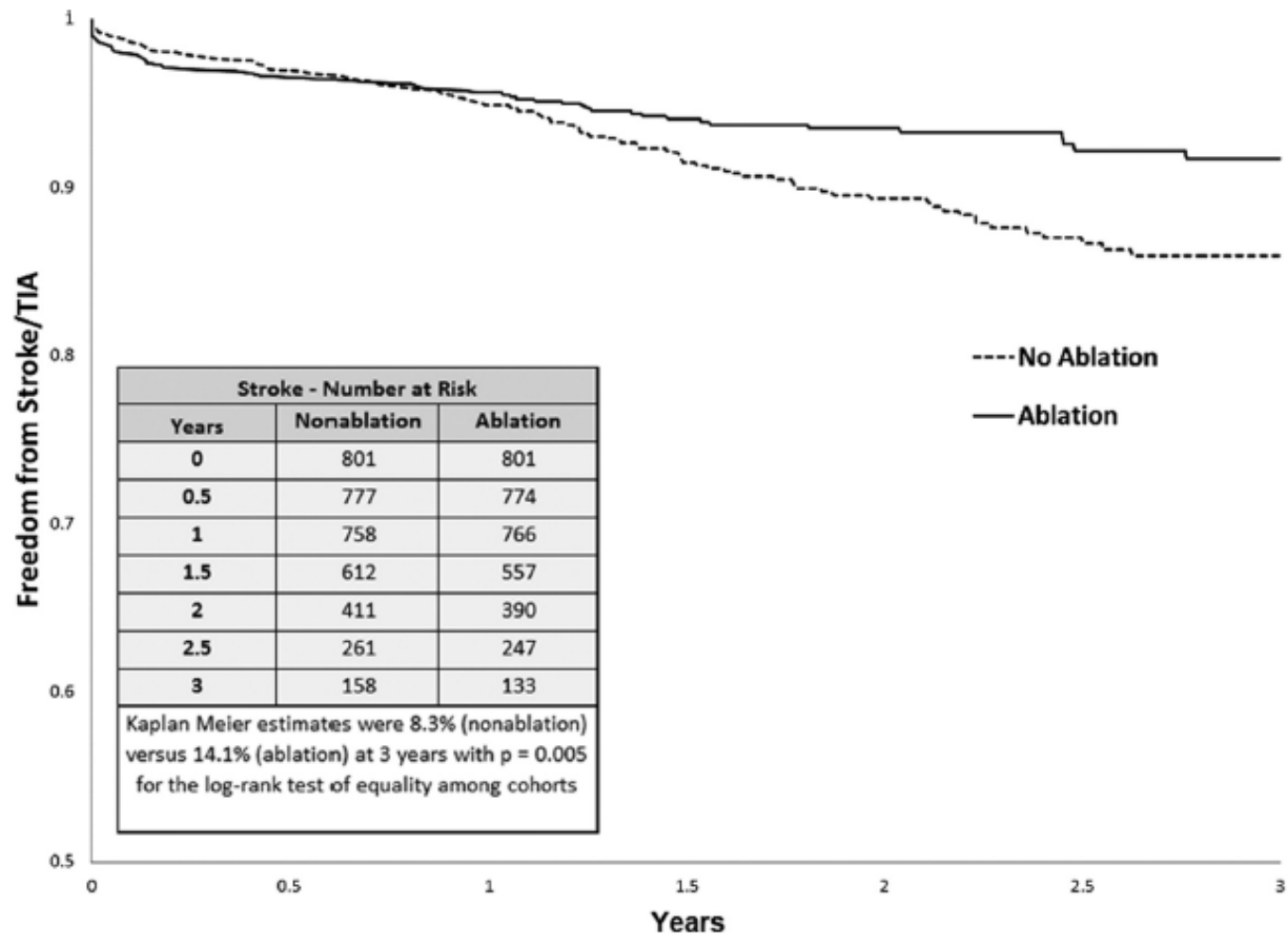


Figure 3. Kaplan-Meier plot of the time to first stroke or transient ischemic attack (TIA) for the propensity-matched groups.

Reynolds et al., J Cardiovasc Electrophysiol 2011

Catheter ablation for AF is associated with lower incidence of stroke and death: data from Swedish health

Stroke

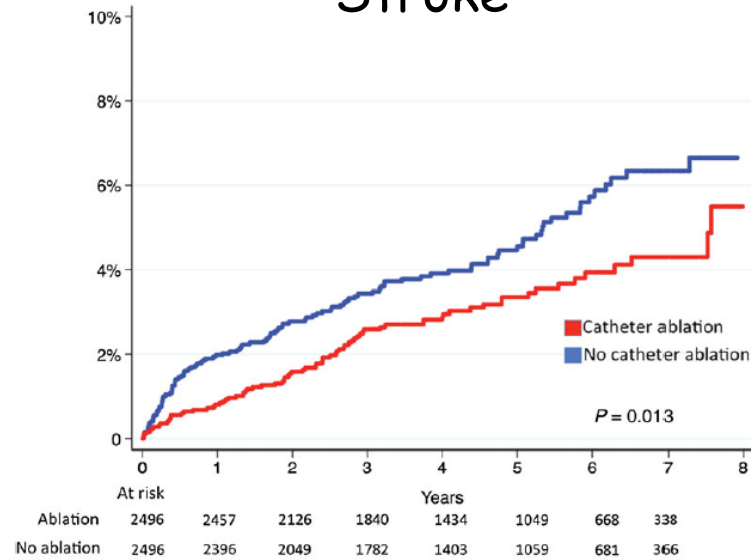


Figure 2 Incidence of ischaemic stroke in relation to atrial fibrillation ablation.

Mortality

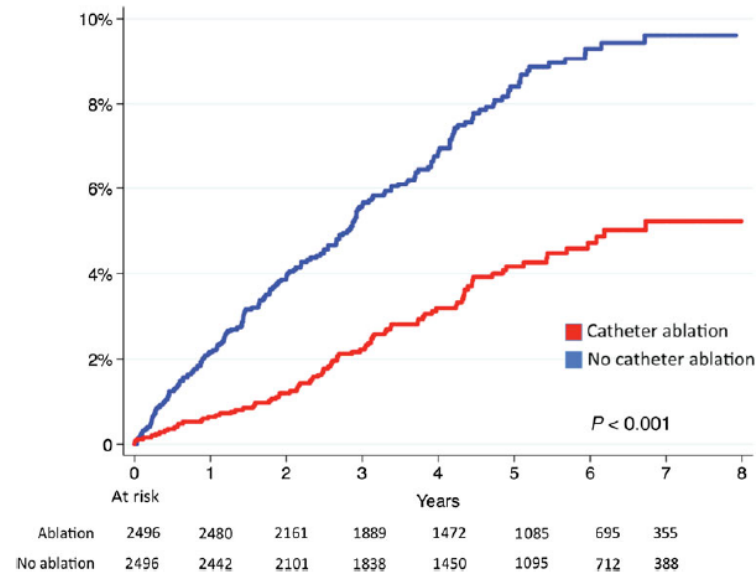


Figure 3 Mortality in relation to atrial fibrillation ablation.

Friberg et al. Eur Heart J 2016

Catheter ablation of AF is associated with reduced risk of stroke and mortality: a propensity score-matched analysis

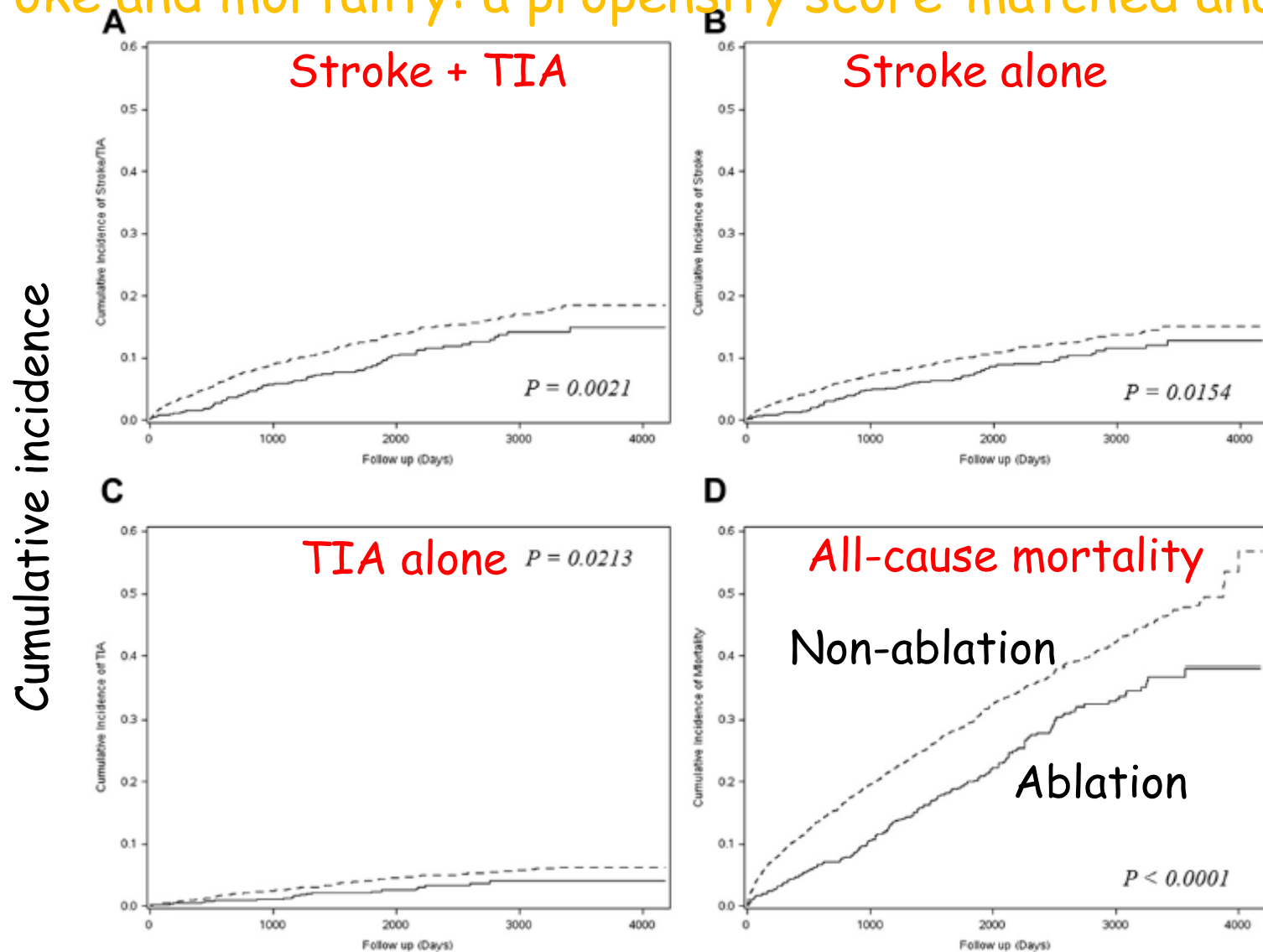
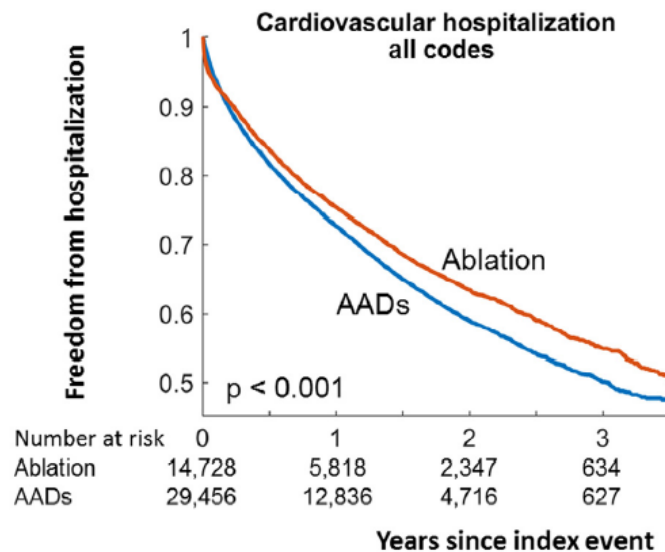
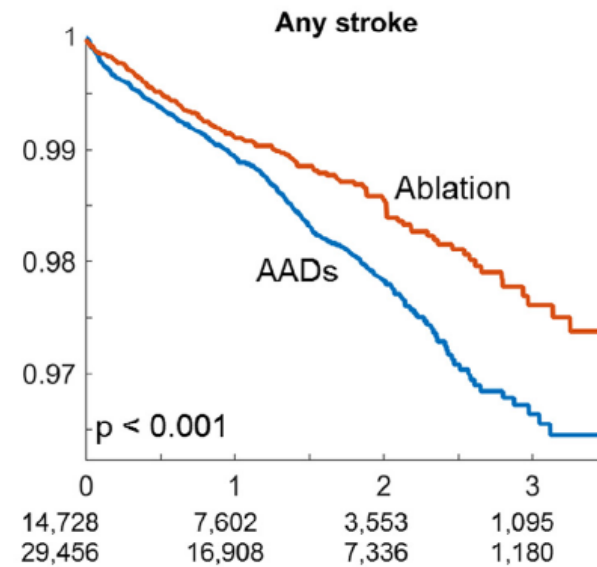
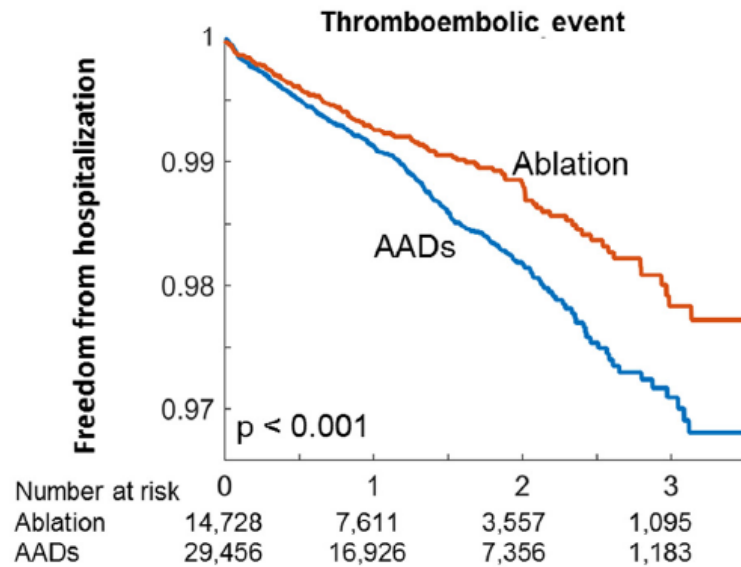


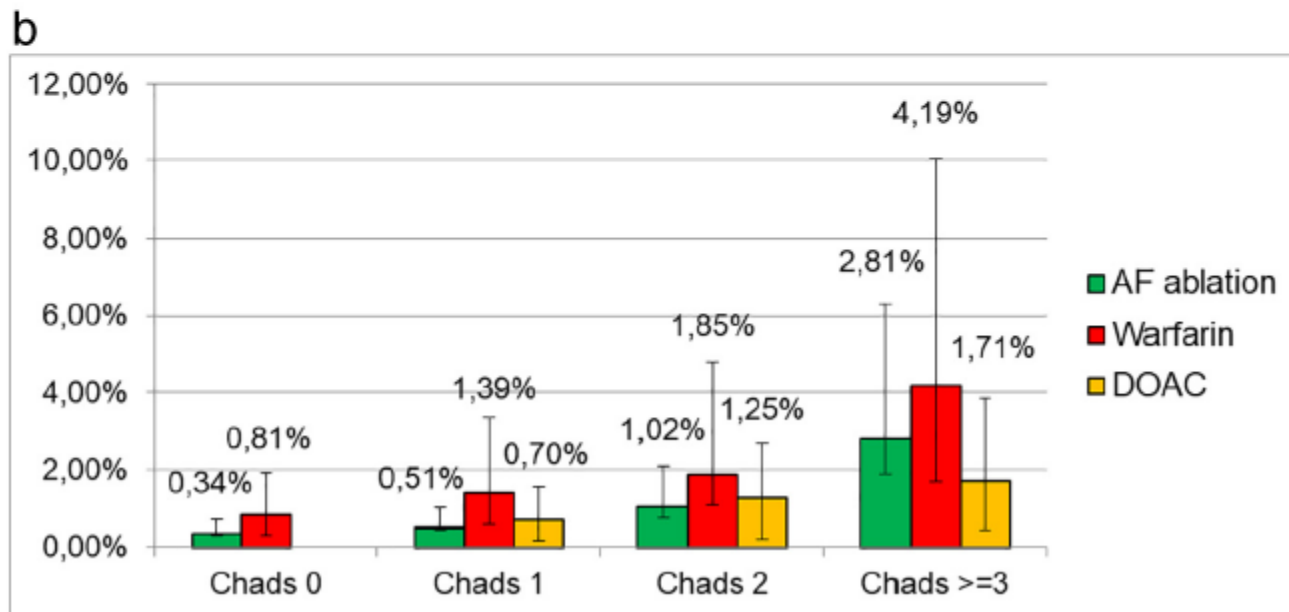
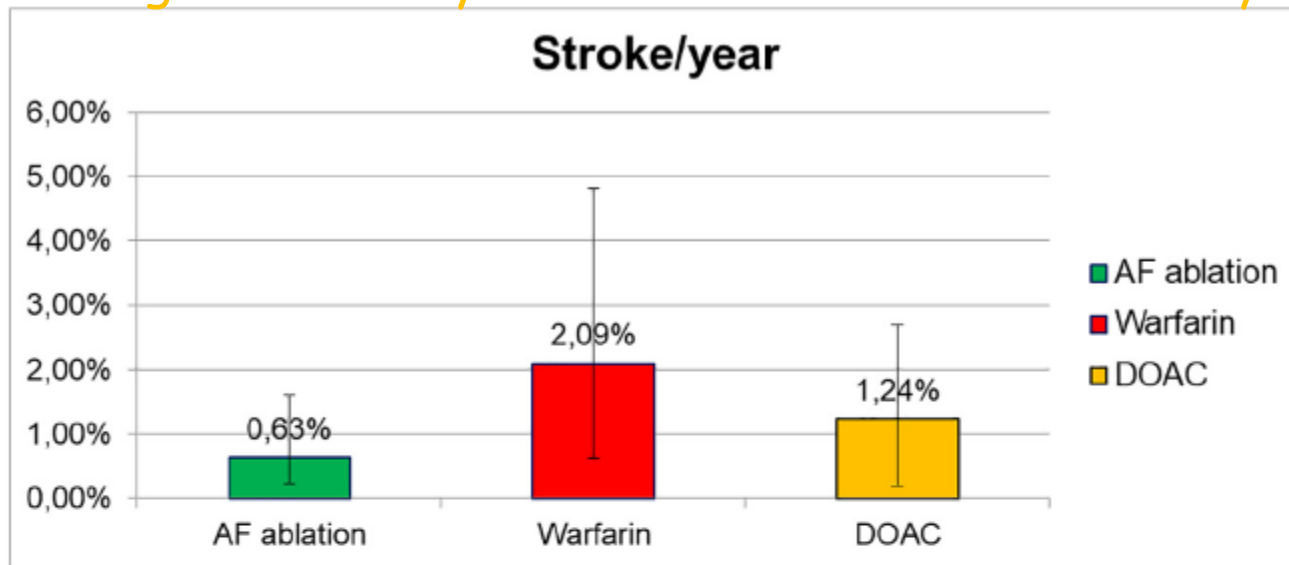
Figure 1 Cumulative incidence function (CIF) for the distribution of time to the primary and secondary outcomes in the propensity score-matched groups (n = 4741): (A) primary outcome (stroke/TIA), (B) stroke alone, (C) TIA alone, and (D) all-cause mortality. Solid lines represent the ablation group, and dotted lines represent the nonablation group.

Stroke and cardiovascular events after ablation or AAD for treatment of patients with atrial fibrillation

Propensity-matched cohorts: Ablation (14,728 pts) vs. AADs (29,456 pts)

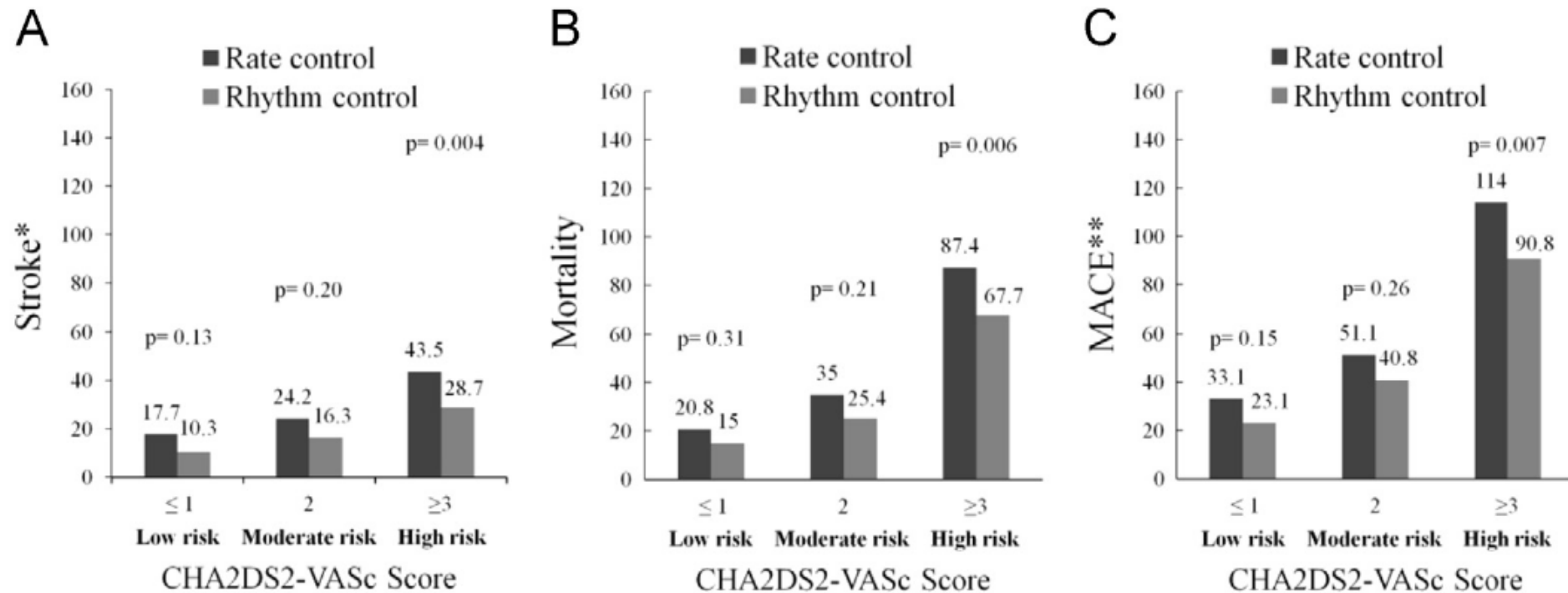


Incidence of thromboembolic events following AF catheter ablation and rate control strategies according to the kind of oral anticoagulation: A systematic review and meta-analysis



Data for rate versus rhythm control strategy on stroke and mortality in patients with atrial fibrillation

2,850/5,054 pts with AF, receiving rhythm (654) or rate (2,196) control



Weng et al. Data in Brief 2018

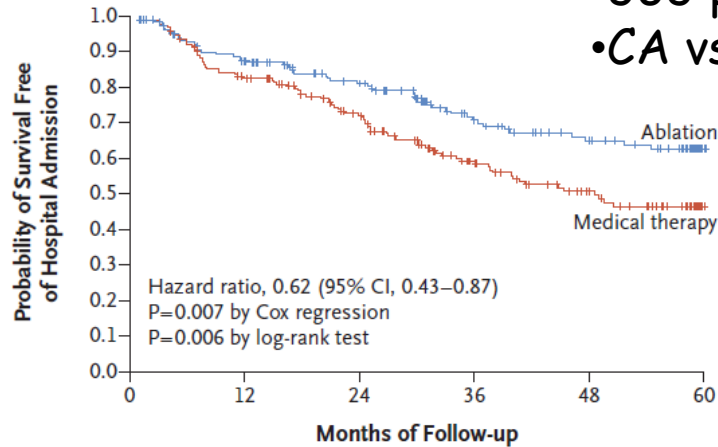
CABANA considerations

- LA ablation vs. drug for rhythm or rate control
- Study start date: November 13, 2009
- Study end date: December 31, 2017
- Patients enrolled: 2204
- Too early to draw conclusions
- Intention to treat analysis: non statistically significant difference between groups
- On treatment analysis: better outcome in patients treated by catheter ablation

Catheter ablation for atrial fibrillation with heart failure CASTE-AF

A Death or Hospitalization for Worsening Heart Failure

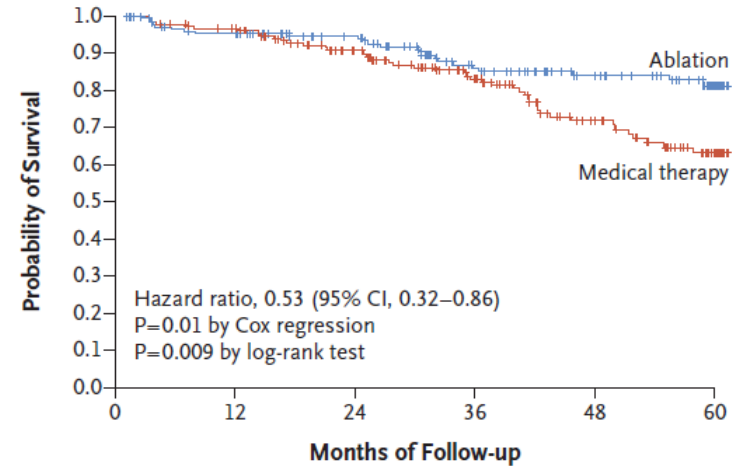
- 363 pts, refractory AF, LVEF $\leq 35\%$, med age 64 yrs
- CA vs. medical therapy (rhythm or rate control)



No. at Risk

Ablation	179	141	114	76	58	22
Medical therapy	184	145	111	70	48	12

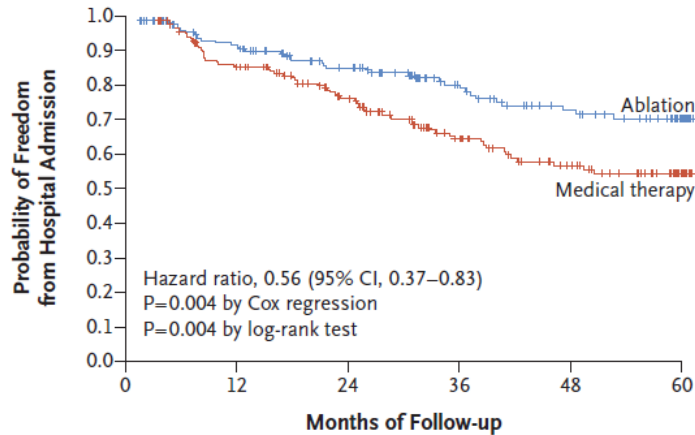
B Death from Any Cause



No. at Risk

Ablation	179	154	130	94	71	27
Medical therapy	184	168	138	97	63	19

C Hospitalization for Worsening Heart Failure



No. at Risk

Ablation	179	141	114	76	58	22
Medical therapy	184	145	111	70	48	12

Choice and Outcomes of Rate Control versus Rhythm Control in Elderly Patients with Atrial Fibrillation: A Report from the REPOSI Study.

Paciullo F^{1,2}, Proietti M³, Bianconi V⁴, Nobili A⁵, Pirro M¹, Mannucci PM⁶, Lip GYH^{3,7}, Lupattelli G¹; REPOSI Investigators.

 Collaborators (405)

 Author information

Abstract

BACKGROUND: Among rate-control or rhythm-control strategies, there is conflicting evidence as to which is the best management approach for non-valvular atrial fibrillation (AF) in elderly patients.

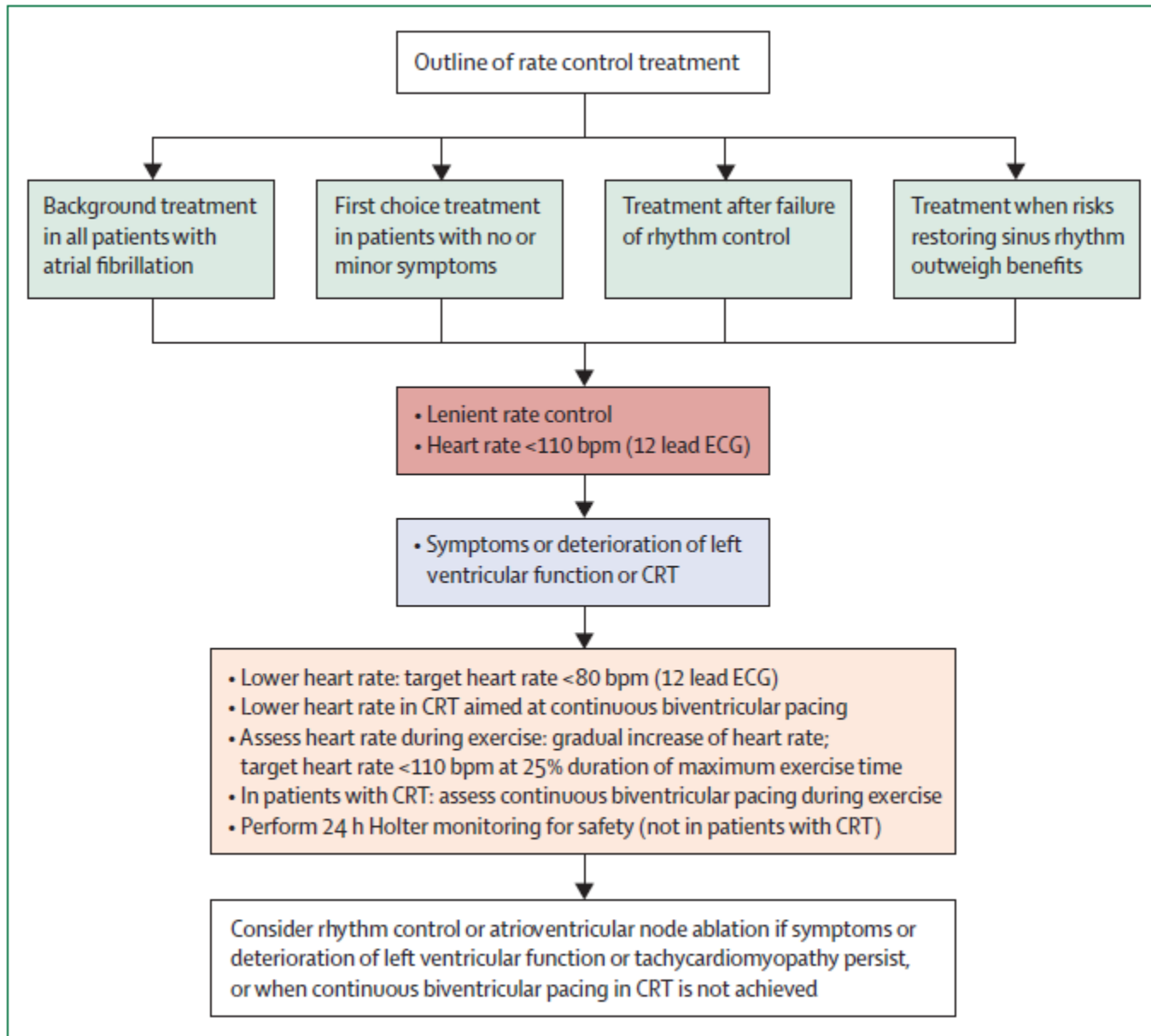
DESIGN: We performed an ancillary analysis from the 'Registro Politerapie SIMI' study, enrolling elderly inpatients from internal medicine and geriatric wards.

METHODS: We considered patients enrolled from 2008 to 2014 with an AF diagnosis at admission, treated with a rate-control-only or rhythm-control-only strategy.

RESULTS: Among 1114 patients, 241 (21.6%) were managed with observation only and 122 (11%) were managed with both the rate- and rhythm-control approaches. Of the remaining 751 patients, 626 (83.4%) were managed with a rate-control-only strategy and 125 (16.6%) were managed with a rhythm-control-only strategy. Rate-control-managed patients were older ($p = 0.002$), had a higher Short Blessed Test (SBT; $p = 0.022$) and a lower Barthel Index ($p = 0.047$). Polypharmacy ($p = 0.001$), heart failure ($p = 0.005$) and diabetes ($p = 0.016$) were more prevalent among these patients. Median CHA₂DS₂-VASc score was higher among rate-control-managed patients ($p = 0.001$). SBT [odds ratio (OR) 0.97, 95% confidence interval (CI) 0.94-1.00, $p = 0.037$], diabetes (OR 0.48, 95% CI 0.26-0.87, $p = 0.016$) and polypharmacy (OR 0.58, 95% CI 0.34-0.99, $p = 0.045$) were negatively associated with a rhythm-control strategy. At follow-up, no difference was found between rate- and rhythm-control strategies for cardiovascular (CV) and all-cause deaths (6.1 vs. 5.6%, $p = 0.89$; and 15.9 vs. 14.1%, $p = 0.70$, respectively).

CONCLUSION: A rate-control strategy is the most widely used among elderly AF patients with multiple comorbidities and polypharmacy. No differences were evident in CV death and all-cause death at follow-up.

Rate control for atrial fibrillation



Conclusive remarks (1)

- AFFIRM data showed no difference in mortality rate for the treatment of rate or rhythm control in AF pts; for some aspects rate control was better
- Currently, AFFIRM data are under re-analysis
- After more than 15 years, mortality, stroke and hospitalization rates in AF pts and the related resources consumption are substantial, especially if the patients are undertreated

Conclusive remarks (2)

- The "new" option catheter ablation for rhythm control is almost 20 years old, safe, effective, and a well established therapy
- Non-randomized data in propensity matched cohorts undergoing ablation or standard therapy show that mortality, stroke and hospitalization rates are lower in pts undergoing ablation
- It too early to discuss the randomized data of the CABANA study
- It is probably time to implement programs to pursue rhythm control by catheter ablation

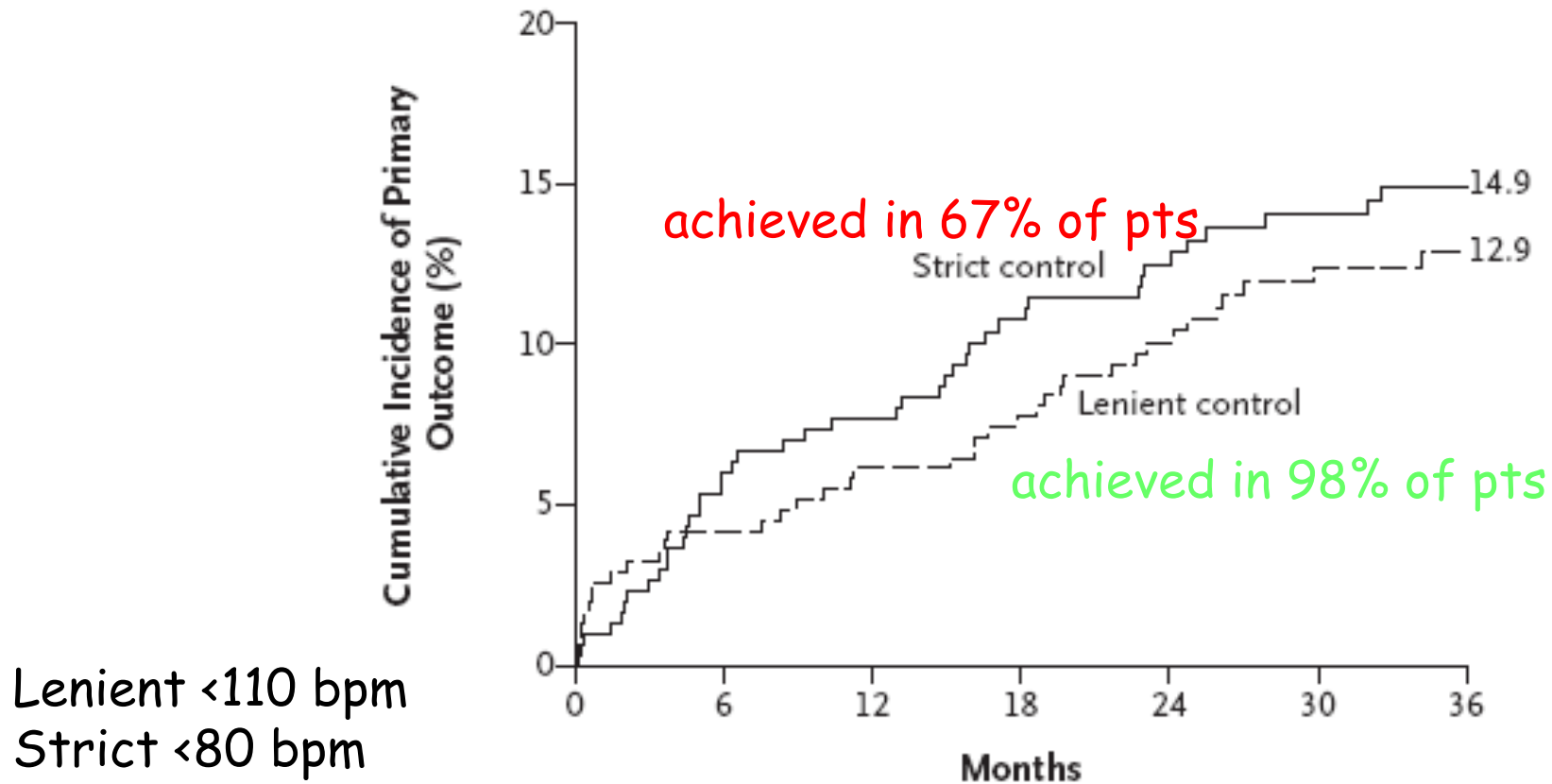
A comparison of rate control and rhythm control in patients with atrial fibrillation

of the patients were in sinus rhythm, and over 80 percent of those in atrial fibrillation had adequate heart-rate control. Radiofrequency ablation to modify or eliminate atrioventricular conduction was used in 105 (5.2 percent) of the patients in the rate-control group after drug failure. During the course of the study, 248 patients crossed over from the rate-control group to the rhythm-control group (actuarial rate of crossover, 7.8 percent, 11.6 percent, and 14.9 percent after one, three, and five years, respectively). Eighty-six of these patients had crossed back to the rate-control group by the end of the study. Uncontrolled symptoms due to atrial fibrillation and congestive heart failure were the most common reasons for the initial crossover to rhythm control in this group.

In the rhythm-control group, more than two thirds of patients started therapy with amiodarone or sotalolol, and by the end of the study almost two thirds of the patients in this group had undergone at least one trial of amiodarone. Maintenance of sinus rhythm was not

itself a primary end point. Patients with intermittent, self-terminating episodes of atrial fibrillation could have been enrolled in the study. The prevalence of sinus rhythm in the rhythm-control group at follow-up was 82.4 percent, 73.3 percent, and 62.6 percent at one, three, and five years, respectively. Electrical cardioversion was attempted once during follow-up in 368 patients, twice in 214 patients, and three or more times in 187 patients in this group. Fourteen patients underwent radiofrequency ablation for atrial flutter or fibrillation; three received an implantable atrial cardioverter (a protocol violation); three underwent a surgical maze procedure³²; and one underwent a catheter-based maze procedure. During the course of the study, 594 patients assigned to the rhythm-control group crossed over to the rate-control group (actuarial rate of crossover, 16.7 percent, 27.3 percent, and 37.5 percent after one, three, and five years, respectively; $P < 0.001$ for the comparison with the rate-control group). Sixty-one of these patients had crossed back to the

Lenient vs. strict rate control in patients with AF

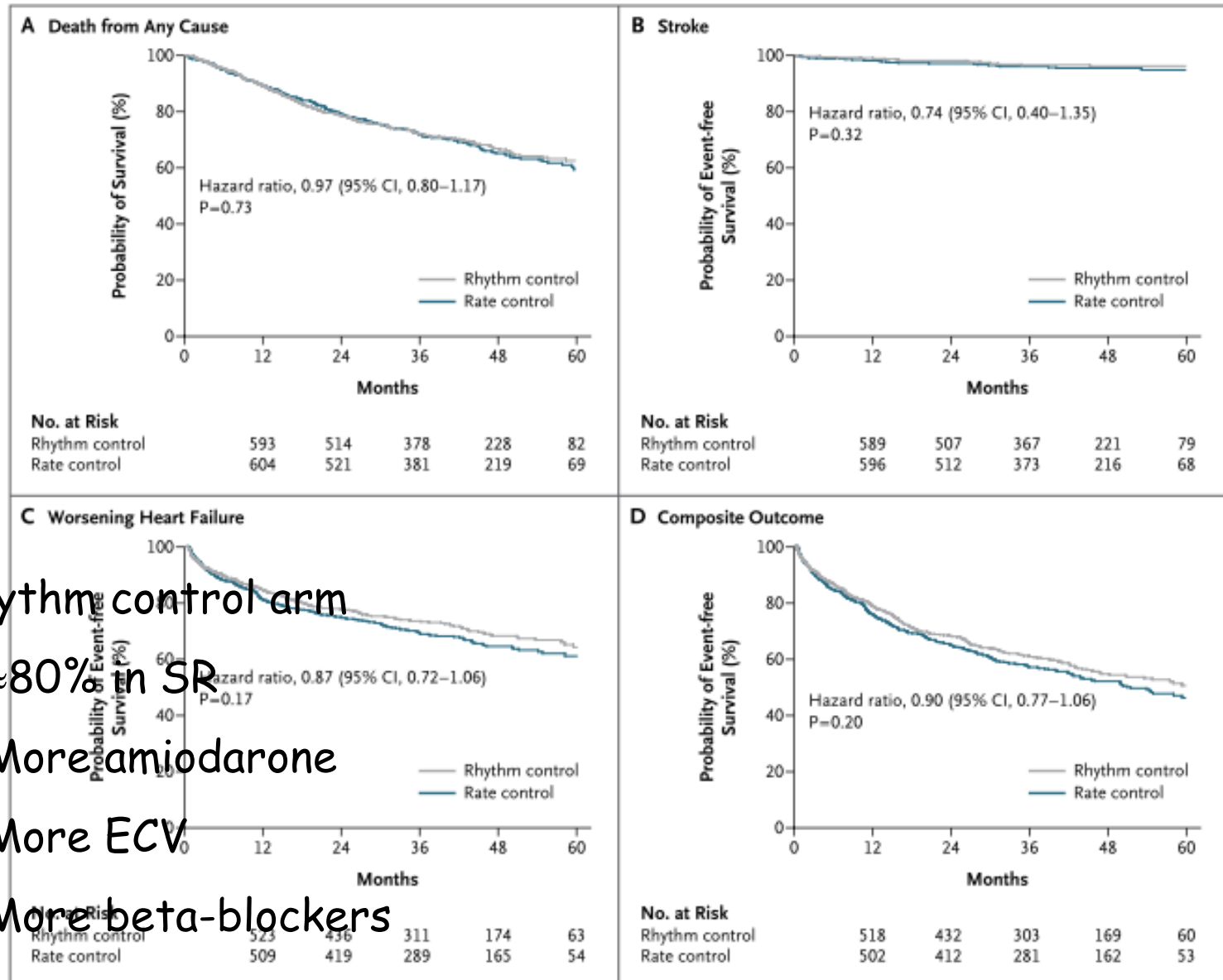


No. at Risk

Strict control	303	282	273	262	246	212	131
Lenient control	311	298	290	285	255	218	138

Figure 2. Kaplan–Meier Estimates of the Cumulative Incidence of the Primary Outcome, According to Treatment Group.

Rhythm control vs. rate control for AF & HF



In rhythm control arm

- ~80% in SR
- More amiodarone
- More ECV
- More beta-blockers



Although non-stroke outcomes are more common, stroke risk scores can be used for prediction in patients with atrial fibrillation

Finlay A. McAlister^{a,*}, Natasha Wiebe^a, Paul E. Ronksley^b, Jeff S. Healey^c

^a Faculty of Medicine and Dentistry, University of Alberta, Edmonton, Canada

^b Dept of Community Health Sciences, Cumming School of Medicine, University of Calgary, Canada

^c Population Health Research Institute, McMaster University, Canada

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ABSTRACT

Background: We investigated whether cardiovascular outcome patterns differ across atrial fibrillation (AF) subgroups defined by age, valvular status, newly diagnosed vs. prevalent cases, or anticoagulation status, and whether stroke risk models can accurately predict non-stroke outcomes.

Methods and results: We performed a retrospective cohort study of all 147,952 adults with AF in Alberta, Canada between January 2008 and March 2014: 23,095 (15.6%) had at least one thromboembolic event (stroke, TIA, or systemic embolism) and 52,618 (35.6%) had a non-stroke major adverse cardiovascular events (NS-MACE = all-cause mortality, new heart failure, new acute coronary syndrome) during follow-up (median 46 months). NS-MACE were 2–3 times more frequent than stroke in all subgroups. Newly diagnosed patients had higher rates of all outcomes in the first year than those with prevalent AF (and those with valvular AF had the highest rates): incident vs. prevalent NS-MACE rates per 100 patient years were 53.1 vs. 23.2 for anticoagulated valvular AF patients, 32.8 vs. 11.0 for non-anticoagulated NVAf patients, and 29.6 vs. 14.6 for anticoagulated NVAf patients. In non-anticoagulated NVAf patients, the stroke risk models exhibited similar accuracy for prediction of NS-MACE as they did for stroke prediction: C-statistics 0.66 [0.66–0.66] vs. 0.67 [0.66–0.68] for ATRIA-STROKE, 0.66 [0.66–0.67] vs. 0.62 [0.61–0.62] for CHADS₂, and 0.62 [0.61–0.62] vs. 0.52 [0.51–0.52] for CHA₂DS₂-VASc.

Conclusions: Non-stroke cardiovascular outcomes are more common than stroke in all AF subgroups but current stroke risk scores exhibit similar (modest) ability to predict risk for NS-MACE as for stroke, allowing identification of high-risk individuals for intervention.

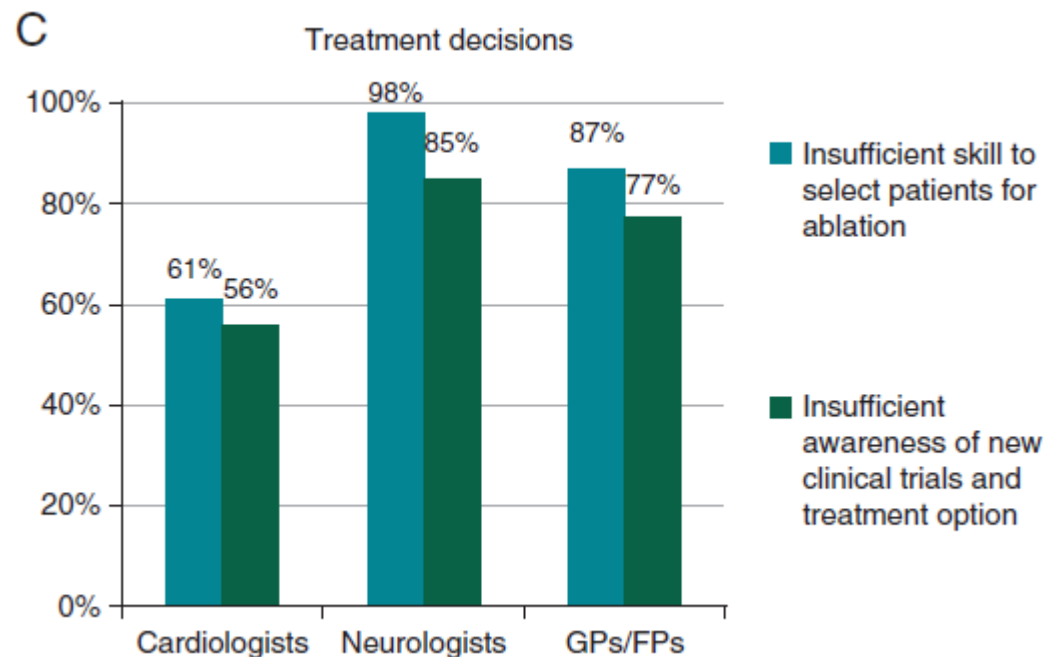
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EHRA survey among European physician treating AF

Table 1 Areas of investigation and key knowledge gaps and barriers as revealed by this study

Category	Areas of investigation (1–11)	Key findings (a–h)
Conditions	1. Identification of underlying pathophysiology of AF	—
	2. Classification of AF (symptom-based vs. pathophysiology-based)	a. Underuse of pathophysiological classification of AF (K, S, A)
Diagnosis	3. Diagnosis and differential diagnosis	b. Difficulties in detecting AF (S, A)
Arrhythmic treatment	4. Clinical decision-making processes: rhythm control vs. rate control	c. Uncertainty when making treatment decisions (K, S, A)
	5. Personalization of treatment and integration of multiple factors in treatment decision	—
Anticoagulation	6. Knowledge and use of guidelines	
	7. Assessment and balancing of stroke risk	
	8. Knowledge, use and attitudes toward anticoagulants	
	9. Patient involvement in treatment plan and management of fears/resistance	
System	10. Communication and collaboration (cardiologists, neurologists, and GPs anti-coagulants follow-up)	
	11. Other system-related barriers to treatment and management of AF	

A, Attitudes; AF: atrial fibrillation; GPs, general practitioners; K, knowledge



Linee guida AIAC per la gestione ed il trattamento della FA

Tabella 4. Raccomandazioni generiche per la scelta della strategia di trattamento della fibrillazione atriale (FA).

	Classe di raccomandazione	Livello di evidenza
• La strategia di controllo del ritmo è la strategia di prima scelta nei pazienti al primo episodio di FA	I	C
• La strategia di controllo del ritmo va mantenuta come prima scelta nei pazienti con FA ricorrente sintomatica in cui la probabilità di mantenere il ritmo sinusale sia elevata o in cui non sia possibile mantenere un adeguato controllo della risposta ventricolare media o nei quali la FA determini un deterioramento emodinamico	I	C
• La strategia di controllo della frequenza è da preferire nei pazienti refrattari alla terapia farmacologica antiaritmica, che hanno presentato numerose recidive ai tentativi di cardioversione e che non abbiano indicazione all'ablazione transcatetere, o nei pazienti in cui, per motivi anagrafici o per la presenza di una cardiopatia sottostante, non sia possibile seguire la strategia di controllo del ritmo	I	C
• La strategia di controllo della frequenza è da preferire nei pazienti anziani, asintomatici o paucisintomatici, con FA persistente e buon compenso emodinamico	I	C
• La strategia di controllo della frequenza è da preferire nei soggetti anziani, con FA ricorrente, scompenso cardiaco e bassa frazione di eiezione	I	C