



Sorrento-ANCE, 11 ottobre 2019



Stato dell'Arte:

Fibrillazione Atriale e Scompenso Cardiaco

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Policlinico-University of Bari “Aldo Moro”

Proclivity of AF and HF to coexist: Prevalence of AF in clinical trials of patients with HF

Trial	Year published	n	AF prevalence (%)	Predominant NYHA class
SOLVD Prevention ¹⁹	1998	4,228	4	I-II
SOLVD Treatment ⁶⁰	1991	2,569	10	II-III
V-HEFT ⁶¹	1993	1,427	14	II-III
CHF-STAT ²⁶⁷	1995	674	15	II-III
DIAMOND-MI ²⁶⁸	2000	1,510	7	II-III
COMET ²⁶⁹	2003	3,029	20*	II-III
CHARM-Added ²⁰	2003	2,558	27	II-III
SCD-HeFT ²⁷⁰	2005	2,521	16*	II-III
I-PRESERVE ²⁷¹	2008	2,128	17*	II-III
ANDROMEDA ²²⁴	2008	627	25	II-III
EMPHASIS-HF ²⁷²	2011	2,737	31*	II-III
A-HeFT ²⁷³	2004	1,052	17	III
GESICA ⁵⁸	1994	516	29	III-IV
DIAMOND-CHF ⁶³	1999	1,518	26	III-IV
CONSENSUS ²⁷⁴	1987	253	50	IV

Comorbidity of atrial fibrillation and heart failure.

Liang-Han Ling, et al.

Nature Reviews Cardiology volume 13, pages 131-147 (2016).

Proclivity of AF and HF to coexist: HF prevalence in trials of anticoagulation in patients with AF

Trial	Year published	n	HF prevalence (%)	% of trial population with permanent or persistent AF
SPAF-II ²⁷⁵	1994	1,100	22	66
SPAF-III ²⁷⁶	1996	1,044	45	84
AFFIRM ¹⁹³	2002	4,060	23	69
ATHENA ²²³	2009	4,628	21	NR
RE-LY ¹⁸⁴	2009	18,113	32	67
ARISTOTLE ¹⁸⁶	2011	18,201	35	85
ROCKET ¹⁸⁵	2011	14,264	63	81
PALLAS ²²⁵	2011	3,236	68	69

Comorbidity of atrial fibrillation and heart failure.
Liang-Han Ling, et al.
Nature Reviews Cardiology volume 13, pages 131-147
(2016).

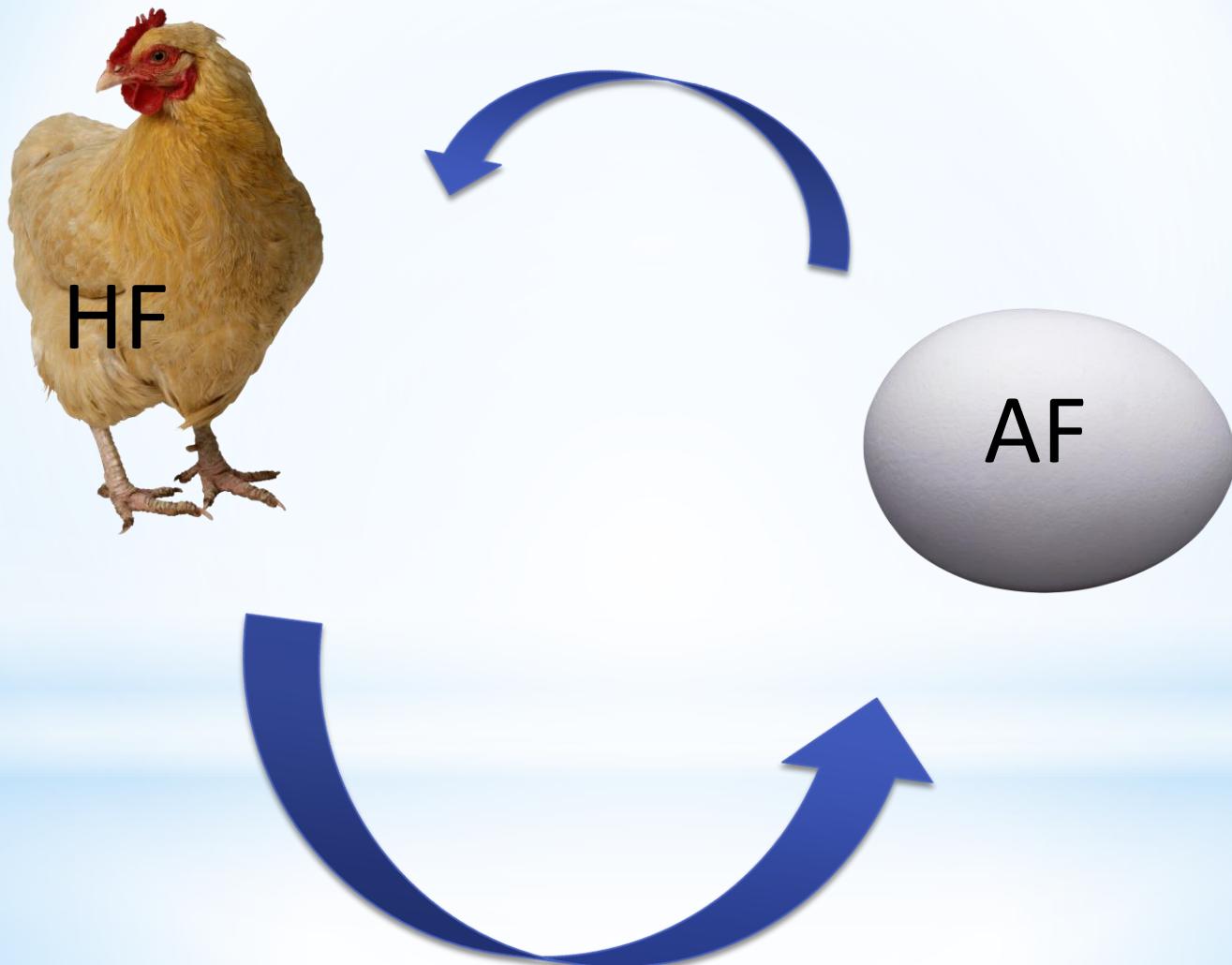


AF in HF

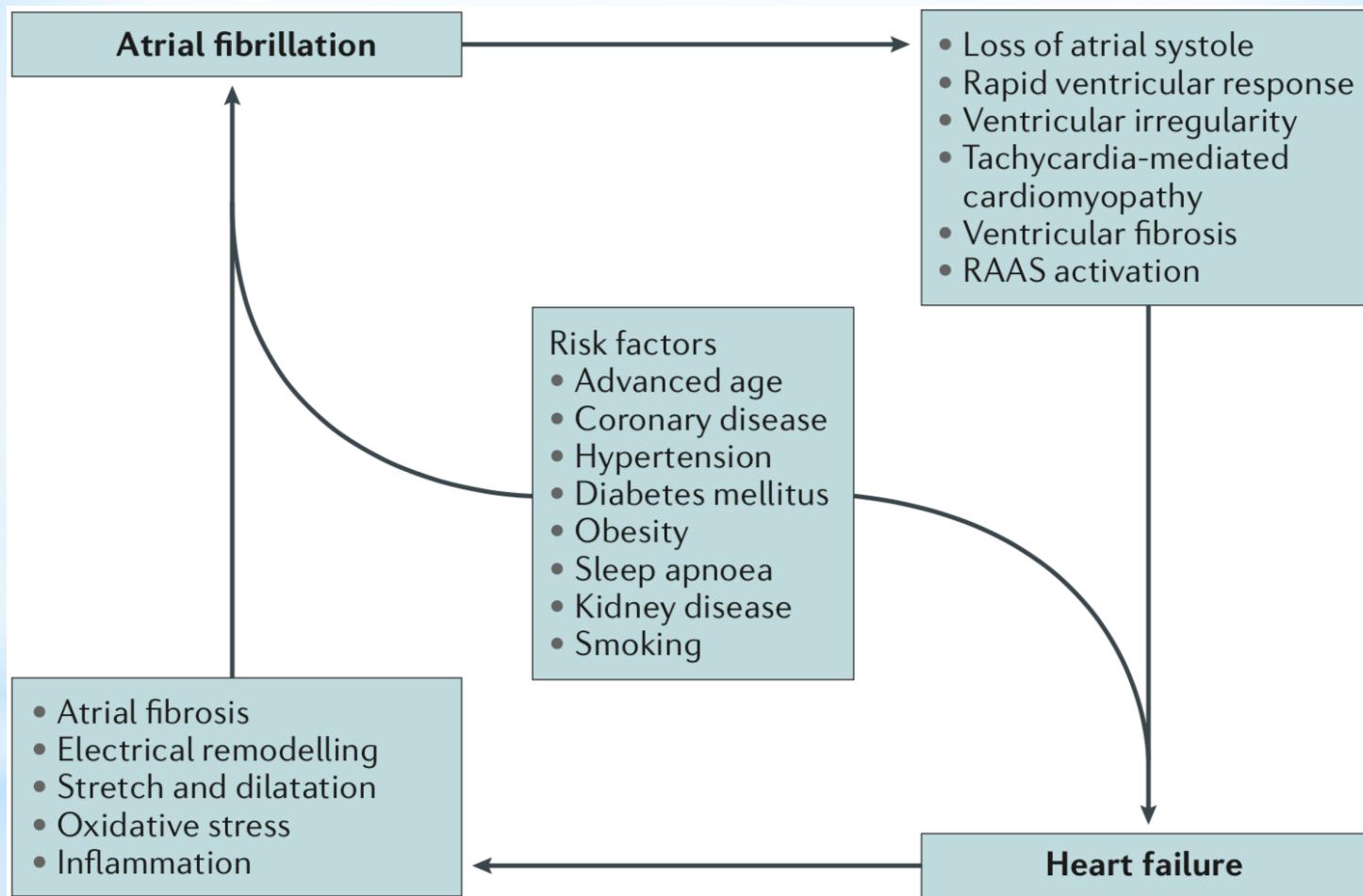
PREVALENCE OF AF IN HF:

- ✓ 5-10% in mild HF
- ✓ 10-26% in moderate HF
- ✓ Up to 50% in advanced HF
- ✓ 20-35% of pts with decompensated HF is in AF

The association between AF and HFrEF



Proclivity of AF and HF to coexist: Risk Factors

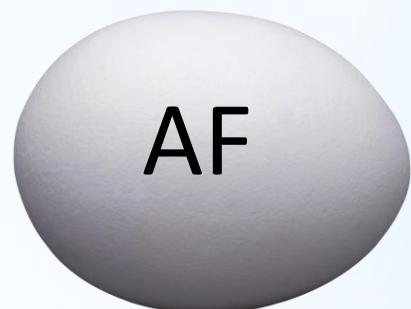
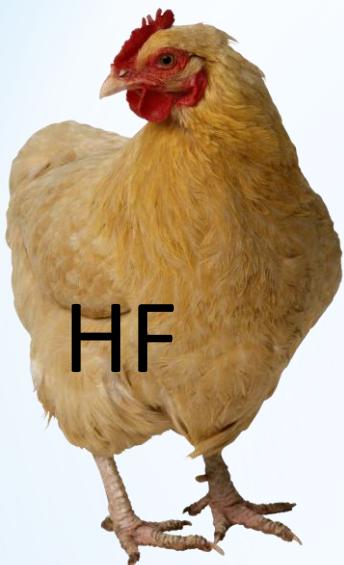


Comorbidity of atrial fibrillation and heart failure.

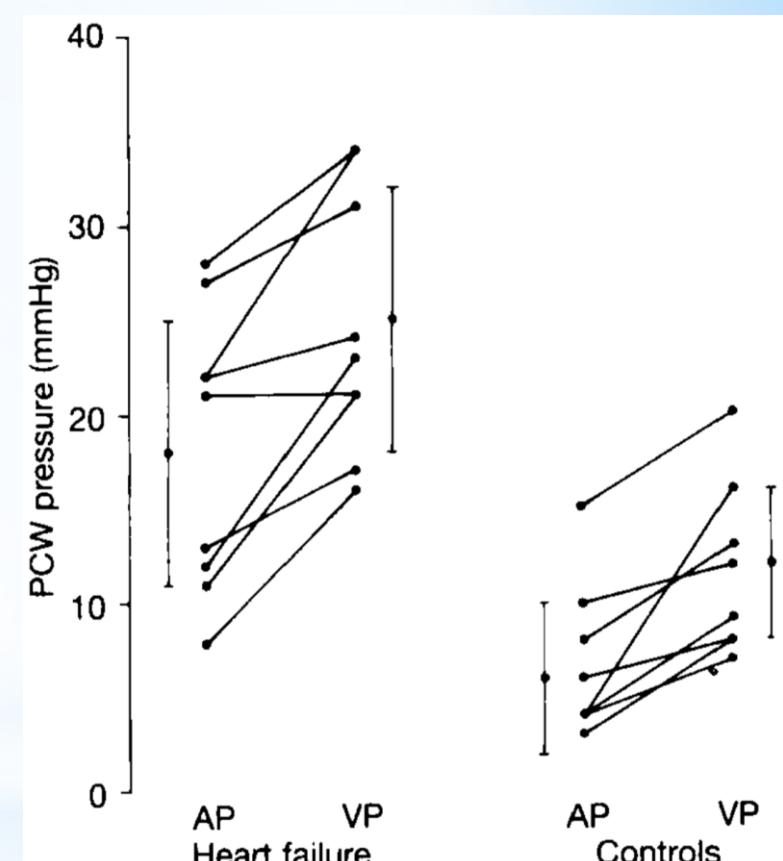
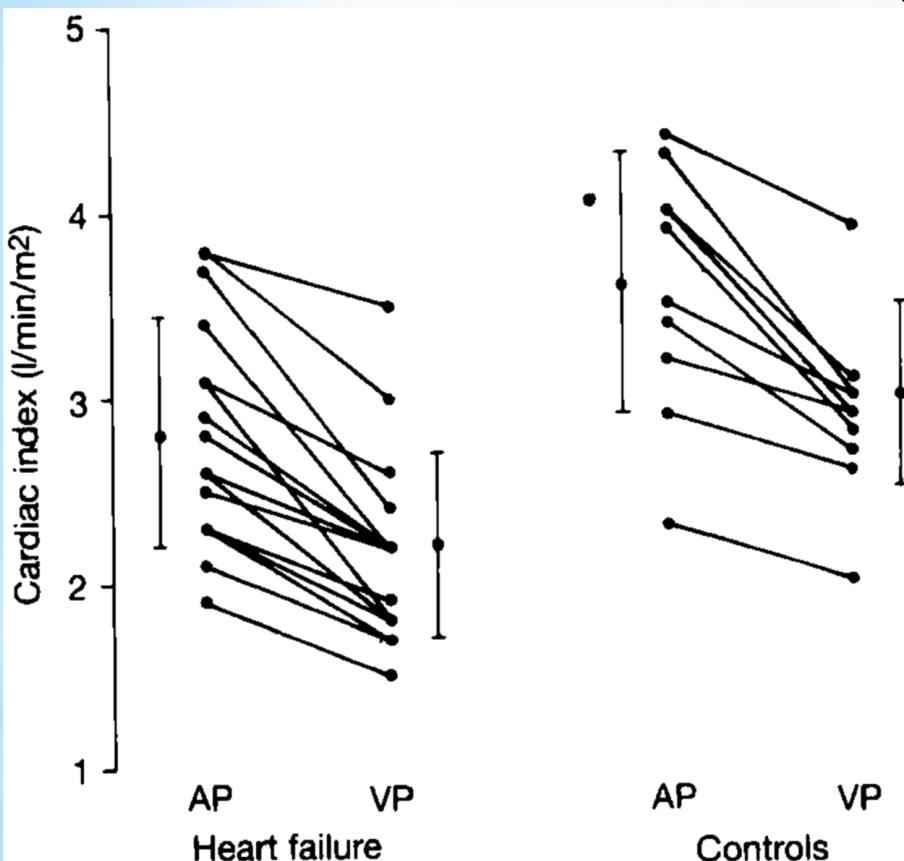
Liang-Han Ling, et al.

Nature Reviews Cardiology volume 13, pages 131-147
(2016).

The HF AF-induced

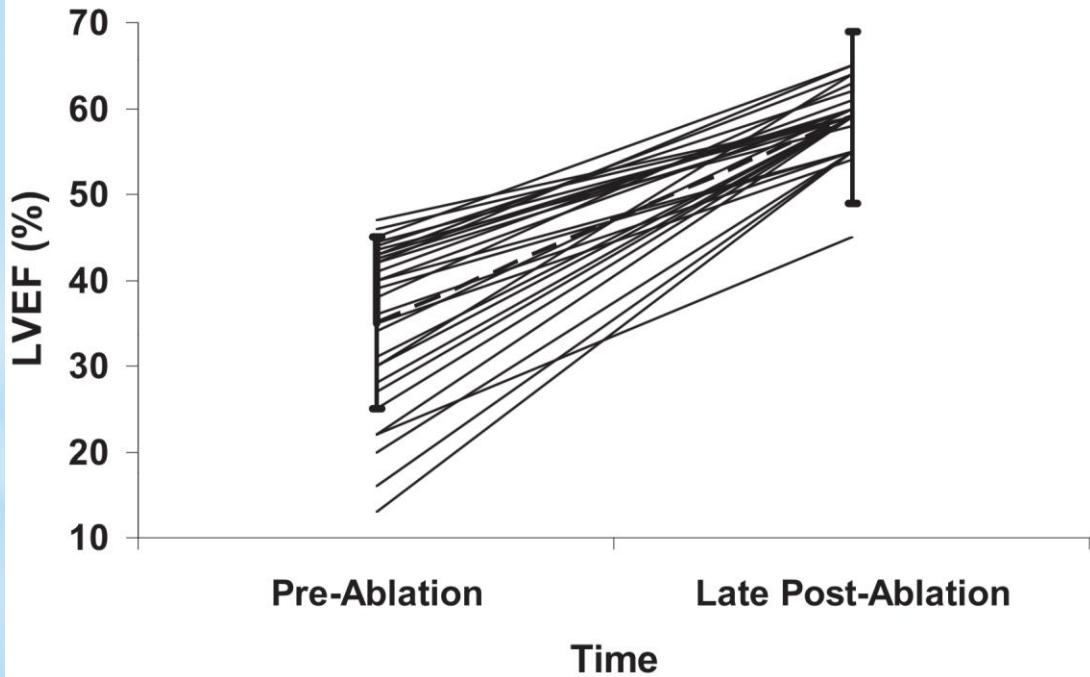


Heart Failure AF-induced : Loss of Atrial Systolic Function



Comparison of Atrial Contribution to Cardiac Hemodynamics in Patients with Normal and Severely Compromised Cardiac Function
J MUKHAR, et al.
Clin. Cardiol. Vol. 1.3, September 1990.

Heart Failure AF-induced : Rapid Ventricular Rates

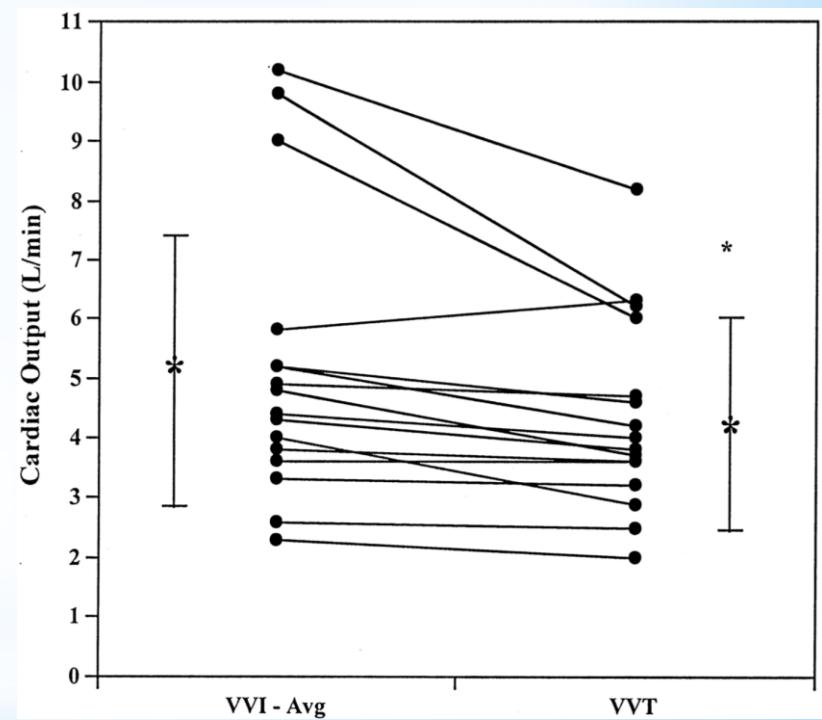
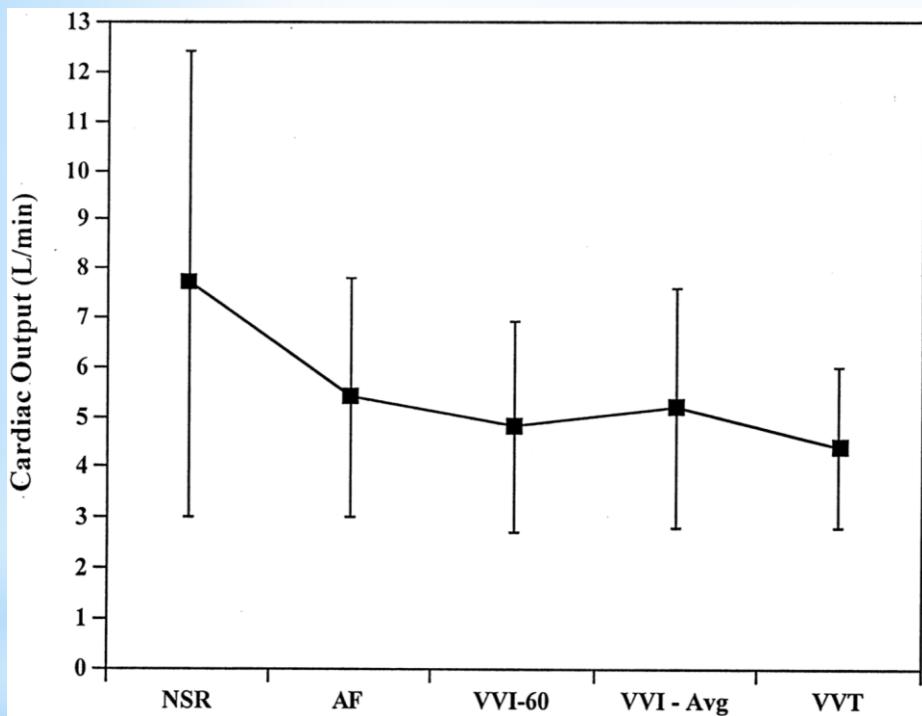


Physiological mechanisms:

- haemodynamic stress;
- activation of neurohormonal systems;
- myocardial and cardiac exoskeleton remodelling;
- induction of apoptosis, cell death;
- replacement fibrosis.

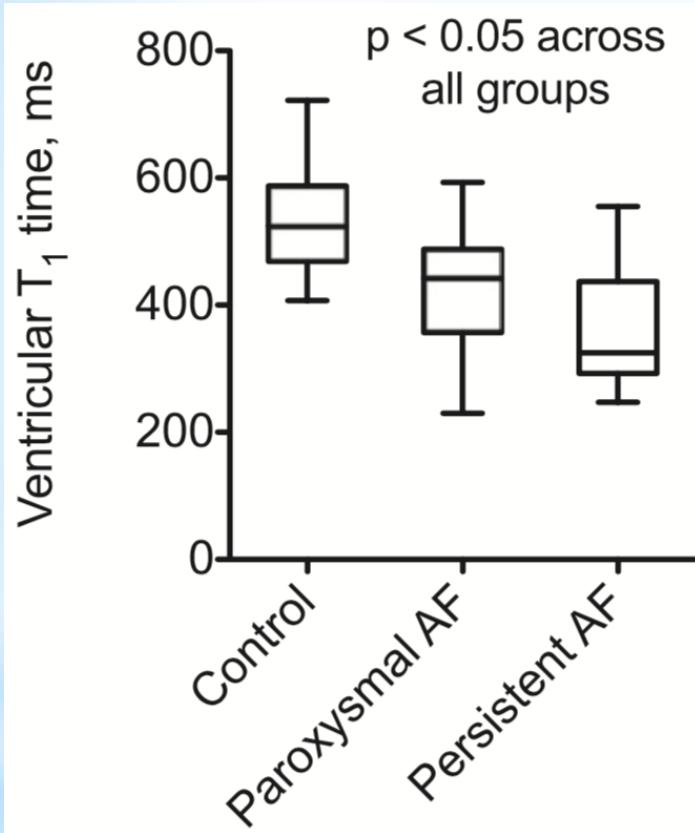
Tachycardia-Mediated Cardiomyopathy Secondary to Focal Atrial Tachycardia. Long-Term Outcome After Catheter Ablation. Caroline Medi, et al.
JACC Vol. 53, No. 19, 2009

Heart Failure AF-induced : Irregular Ventricular Rates

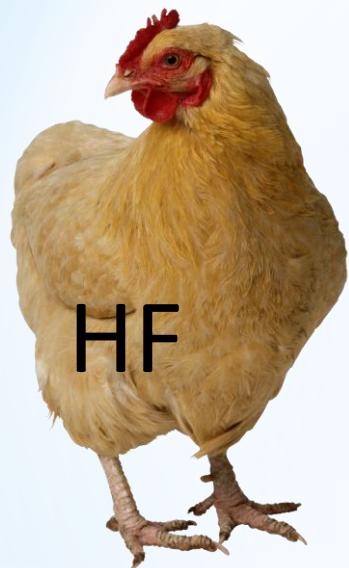


*Hemodynamic Effects of an Irregular Sequence of
Ventricular Cycle Lengths During Atrial Fibrillation*
DAVID M. CLARK, et al.
JACC Vol. 30, No. 4 October 1997:1039-45

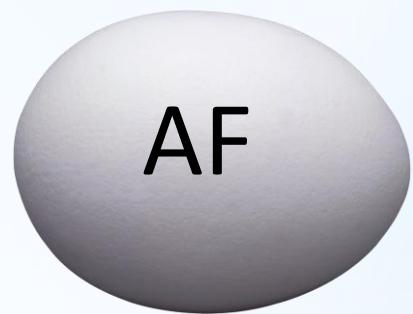
Heart Failure AF-induced : Diffuse ventricular fibrosis



- Noninvasive assessment of interstitial LV fibrosis has been made possible through cardiac magnetic resonance T1 mapping.
- Diffuse LV fibrosis has been demonstrated in patients with highly symptomatic AF.
- **The degree of ventricular fibrosis was related to AF burden**



HF

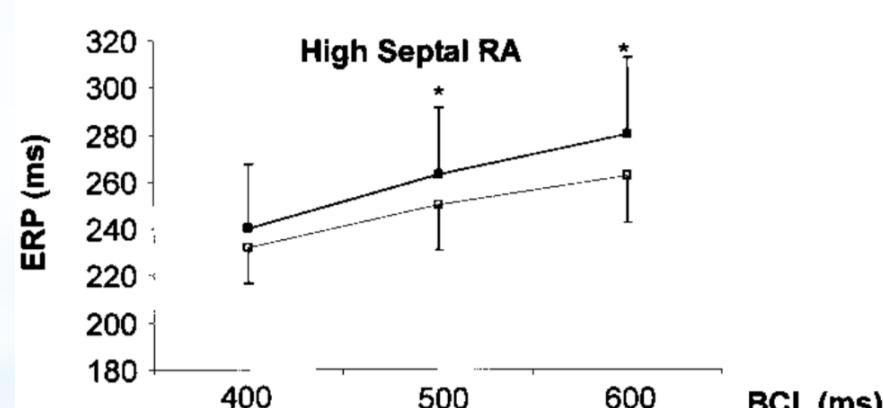
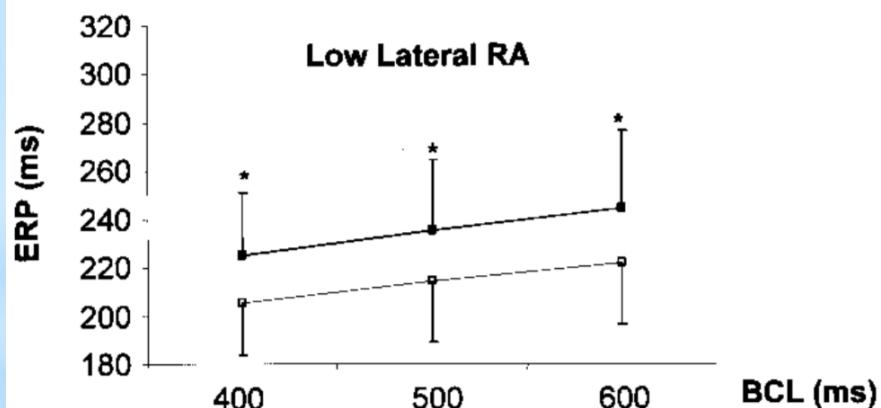
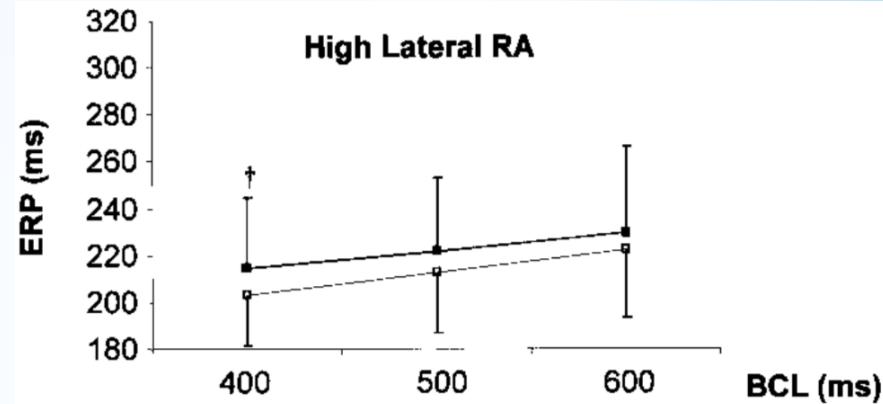
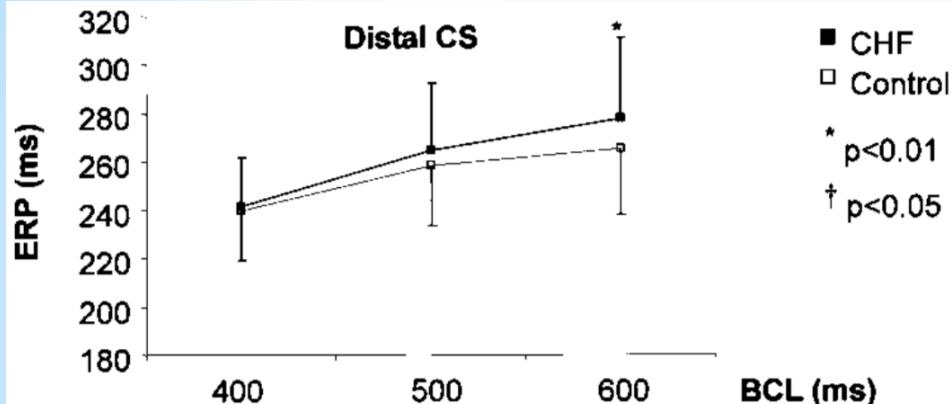


AF



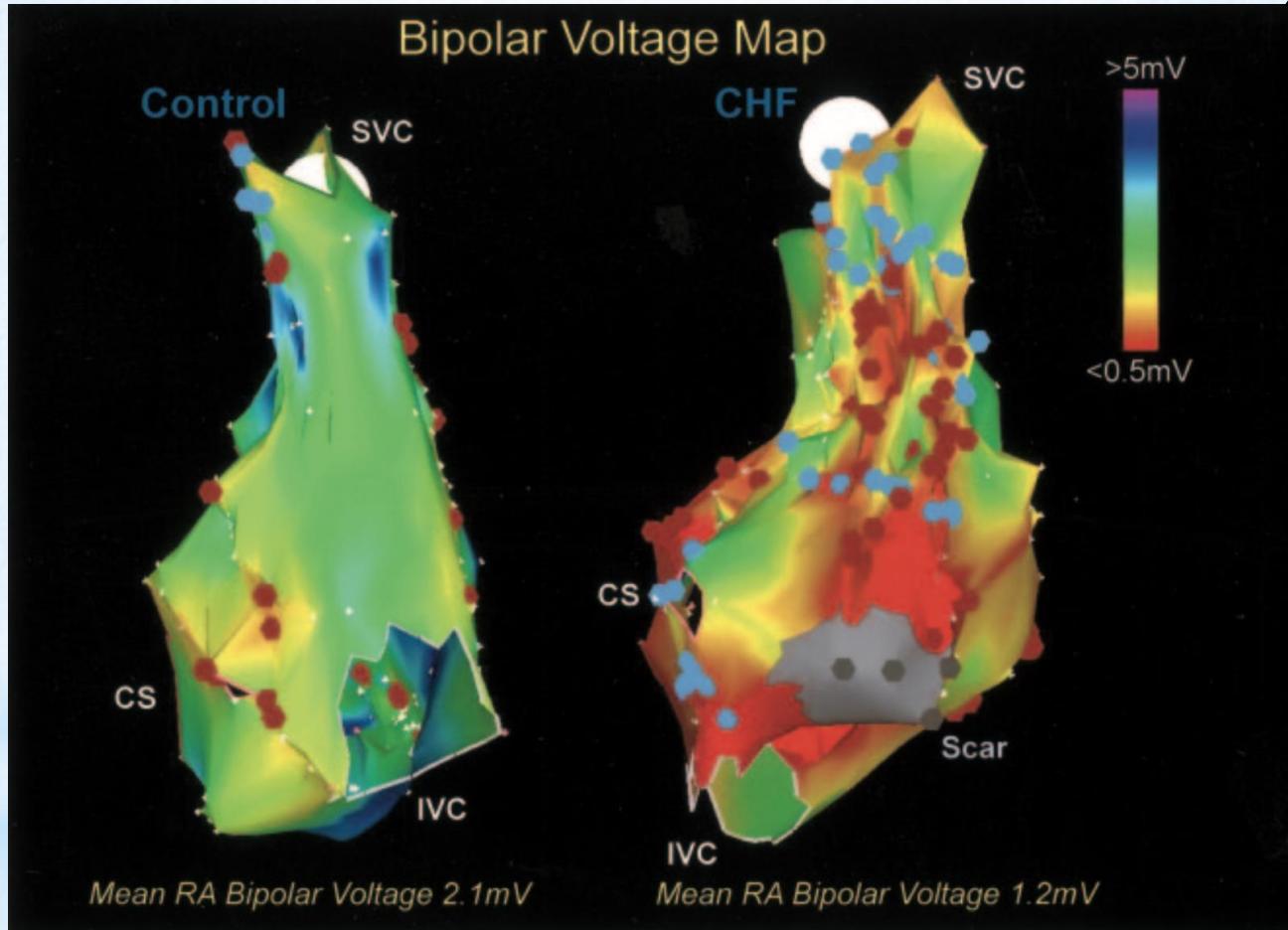
AF HF-induced

Atrial Fibrillation HF-induced : Electrical and Structural Remodelling in HF



Electrical Remodeling of the Atria in Congestive Heart Failure. Electrophysiological and Electroanatomic Mapping in Humans.
Prashanthan Sanders, et al.
Circulation. 2003;108:1461-1468.

Atrial Fibrillation HF-induced : Electrical and Structural Remodelling in HF



Electrical Remodeling of the Atria in Congestive Heart Failure. Electrophysiological and Electroanatomic Mapping in Humans.

Prashanthan Sanders, et al.
Circulation. 2003;108:1461-1468.

Atrial Fibrillation HF-induced : Functional Mitral Regurgitation

Variable	OR	95% CI	p Value
Age >60 years	4.0	2.7 to 5.9	<0.001
Female gender	1.7	1.2 to 2.4	0.003
Previous infarction	1.3	0.9 to 1.9	0.11
Diabetes	1.1	0.8 to 1.6	0.59
Smoking	0.9	0.8 to 1.2	0.95
History of hypertension	1.8	1.3 to 2.4	0.008
eGFR <60 ml/minute	2.5	1.8 to 3.5	<0.001
Anterior infarction	1.2	0.9 to 1.7	0.59
Killip class >I	2.9	2.0 to 4.0	<0.001
LVEF <45%	2.3	1.6 to 3.2	<0.001
Left atrial diameter >4 cm	2.4	1.7 to 3.4	<0.001
Coronary revascularisation	1.5	0.8 to 2.3	0.33
FMR			
None/trivial	1.0 (Referent)	—	—
Mild	2.4	1.7 to 3.6	<0.001
Moderate or severe	4.4	2.7 to 7.2	<0.001

Relationship of functional mitral regurgitation to new-onset atrial fibrillation in acute myocardial infarction.

Fadel Bahouth, et al.
Heart 2010;96:e683-e688.

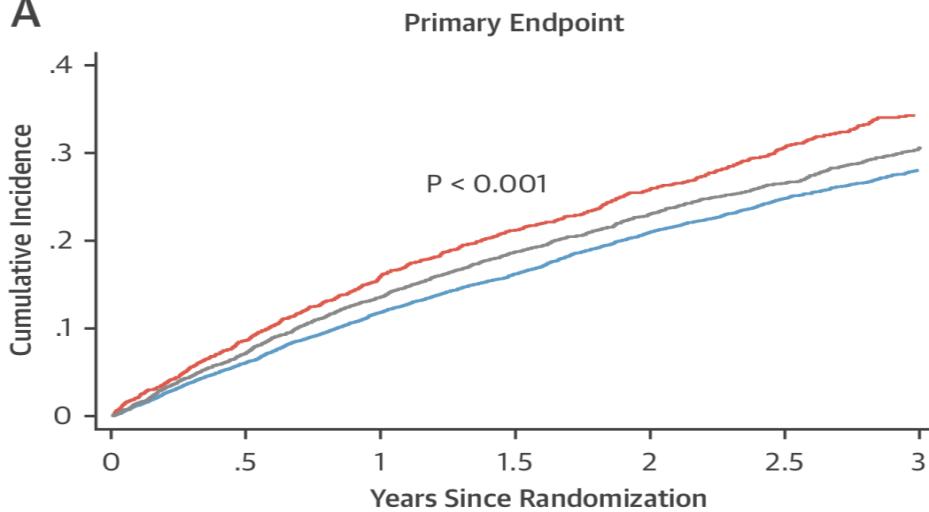
AF TYPE



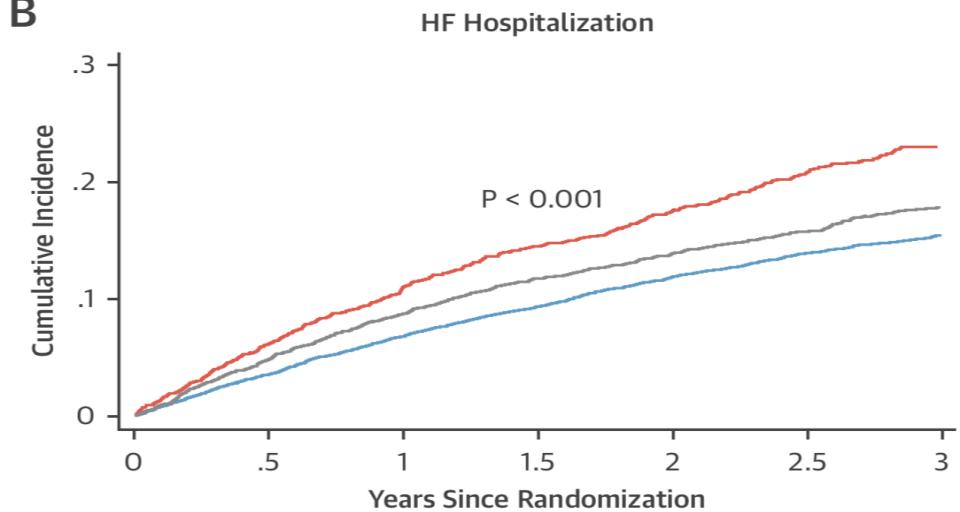
JACC 2017

Type of Atrial Fibrillation and Outcomes in Patients With Heart Failure and Reduced Ejection Fraction

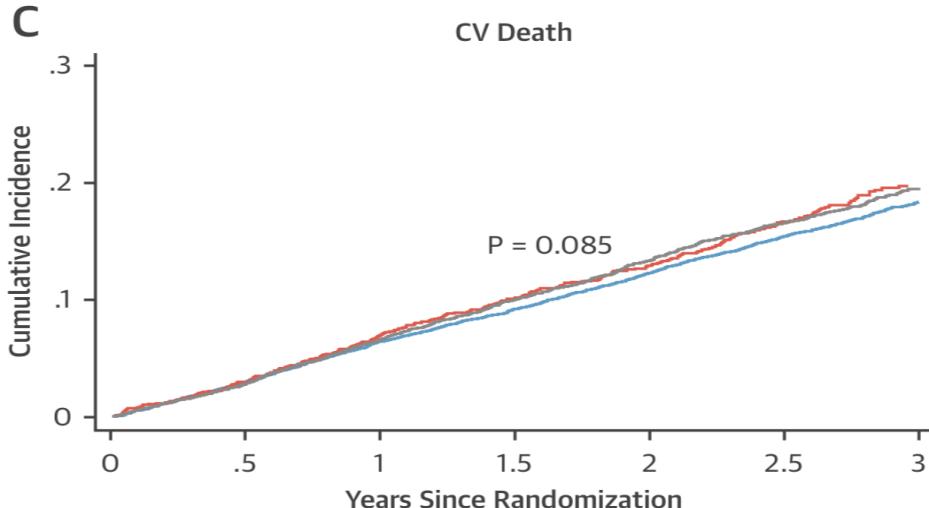
A



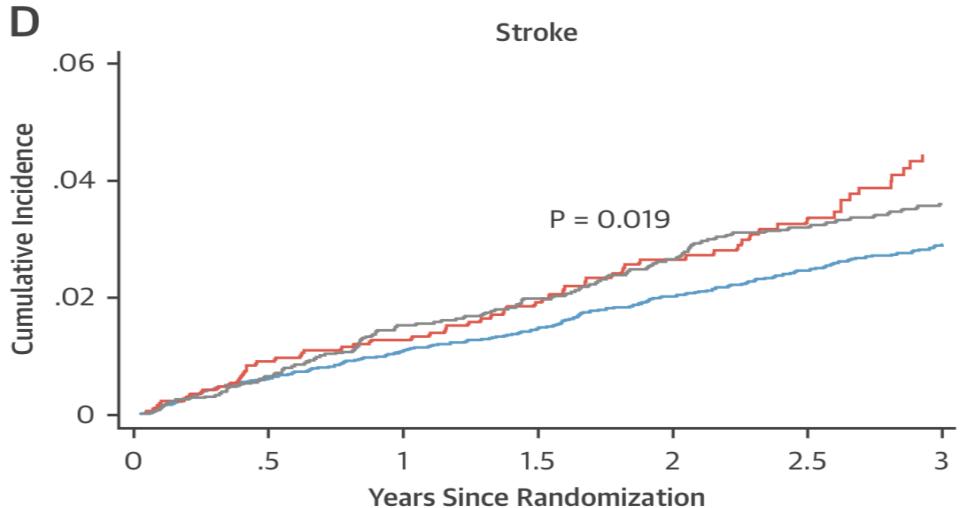
B



C

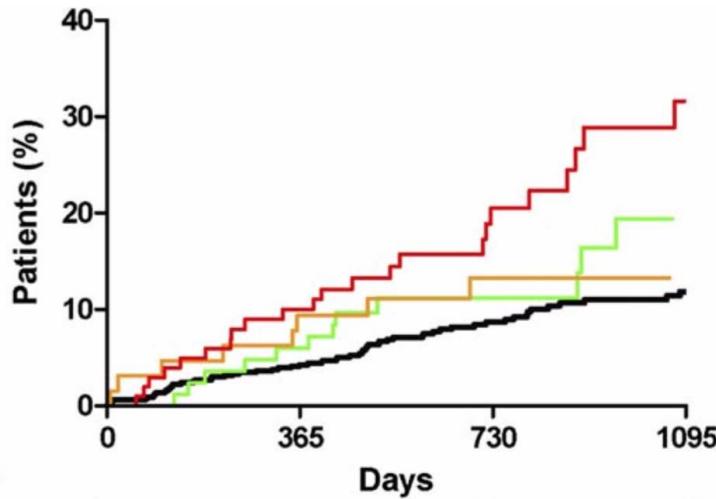


D



— No AF — Paroxysmal AF — Persistent/permanent AF

Prognostic Importance of Atrial Fibrillation in Implantable Cardioverter-Defibrillator Patients

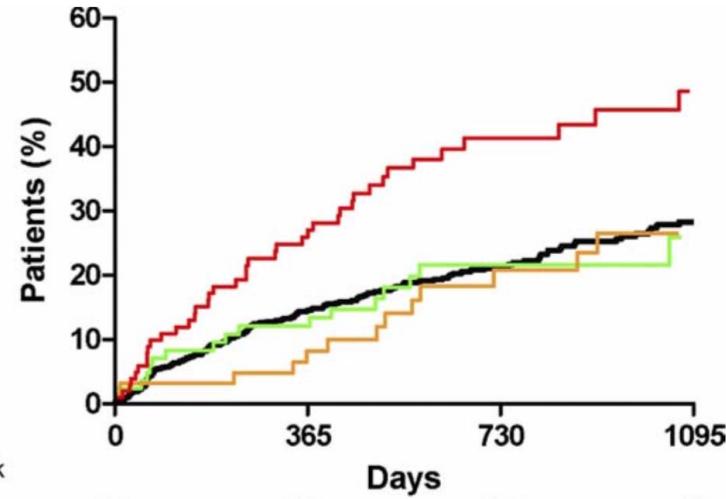


Patients at risk

	0	365	730	1095
Patients at risk				
No AF	663	618	358	198
Paroxysmal AF	84	78	44	22
Persistent AF	64	59	42	24
Permanent AF	102	89	49	23

Figure 1 All-Cause Mortality

Kaplan-Meier curve for all-cause mortality in patients without a history of atrial fibrillation (AF) (no AF, **black line**), paroxysmal AF (**green line**), persistent AF (**orange line**), or permanent AF (**red line**).



Patients at risk

	0	365	730	1095
Patients at risk				
No AF	663	528	279	143
Paroxysmal AF	84	68	38	16
Persistent AF	64	54	33	16
Permanent AF	102	67	34	17

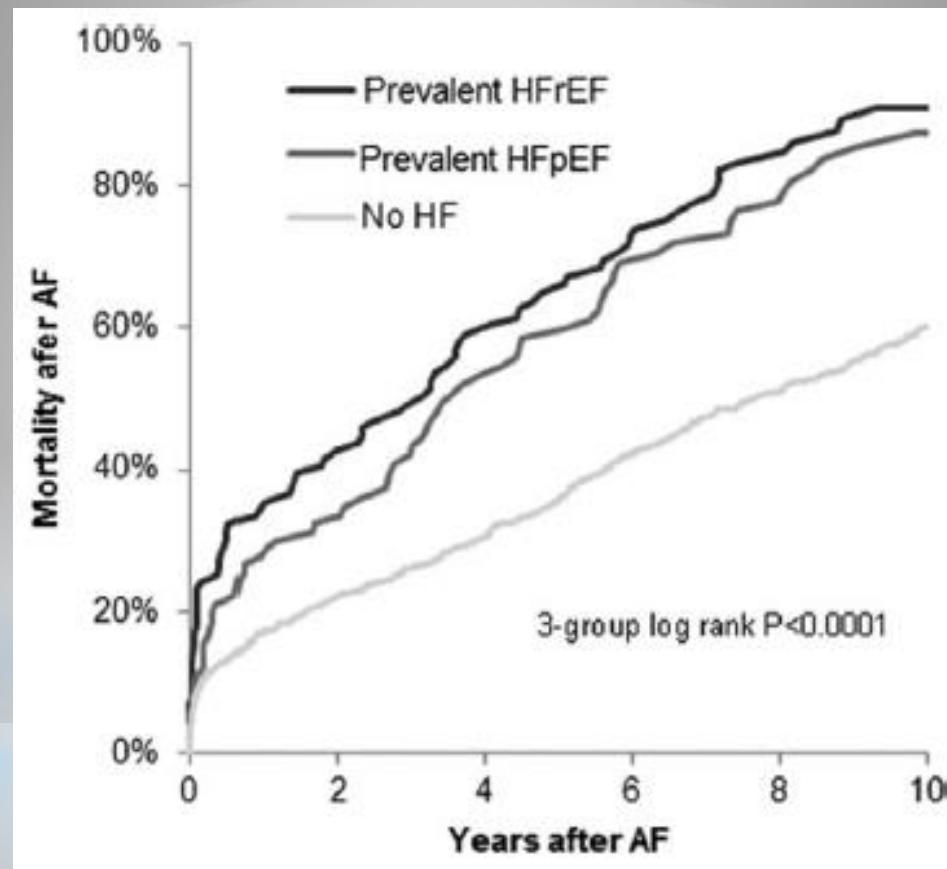
Figure 2 Appropriate Device Therapy

Kaplan-Meier curve for the occurrence of first appropriate device therapy in patients without a history of atrial fibrillation (AF) (no AF, **black line**), paroxysmal AF (**green line**), persistent AF (**orange line**), or permanent AF (**red line**).

HF TYPE

HFrEF vs HFpEF

AF in HFrEF and HFpEF: the role of systolic dysfunction vs diastolic dysfunction



Verma et al., Treatment of Patients With Atrial Fibrillation and Heart Failure With Reduced Ejection Fraction. Circulation 2017

Heart Failure With Preserved Ejection Fraction and Atrial Fibrillation

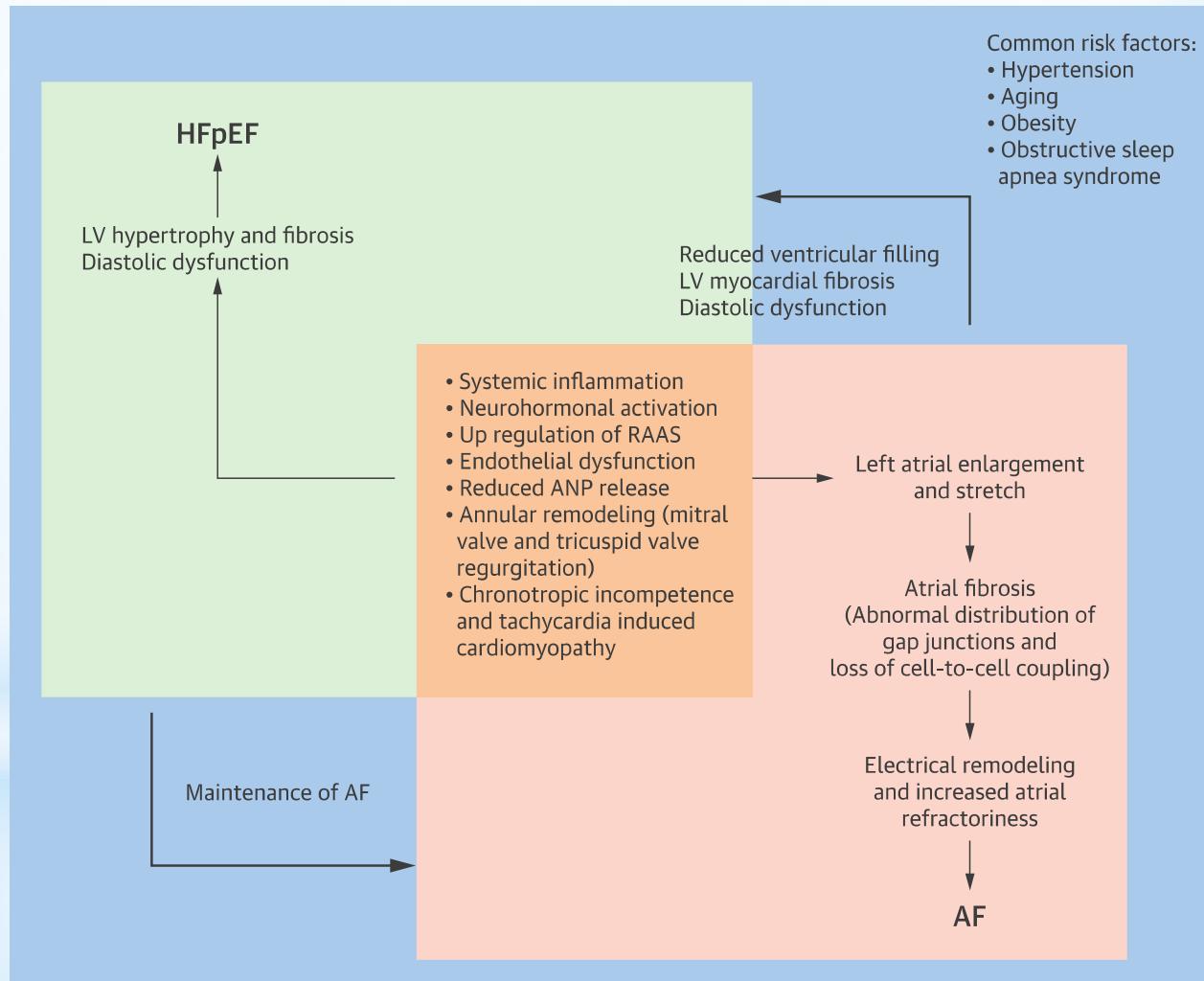


Vicious Twins

JACC 2016

Dipak Kotecha, MD, PhD,^a Carolyn S.P. Lam, MD, PhD,^b Dirk J. Van Veldhuisen, MD, PhD,^c
Isabelle C. Van Gelder, MD, PhD,^d Adriaan A. Voors, MD, PhD,^c Michiel Rienstra, MD, PhD^c

FIGURE 3 Pathophysiology and Shared Mechanisms in HFpEF and AF



Common mechanisms involved in HFpEF, AF, and the combination of these conditions. ANP = atrial natriuretic peptide; LV = left ventricular; RAAS = renin-angiotensin-aldosterone system; other abbreviations as in Figure 1.

Heart Failure With Preserved Ejection Fraction and Atrial Fibrillation



JACC 2016

Vicious Twins

Dipak Kotecha, MD, PhD,^a Carolyn S.P. Lam, MD, PhD,^b Dirk J. Van Veldhuisen, MD, PhD,^c
Isabelle C. Van Gelder, MD, PhD,^c Adriaan A. Voors, MD, PhD,^c Michiel Rienstra, MD, PhD^c

FIGURE 1 Prevalence of HFpEF in AF

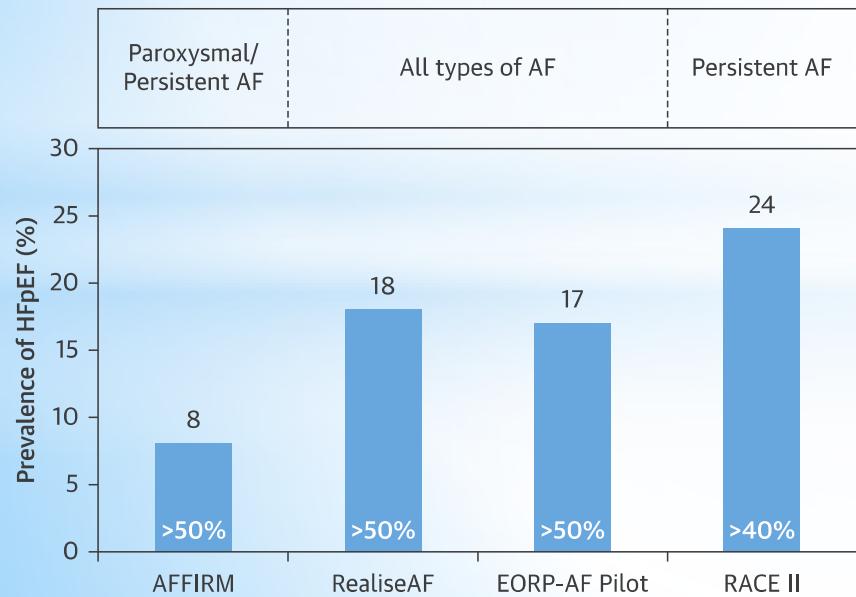
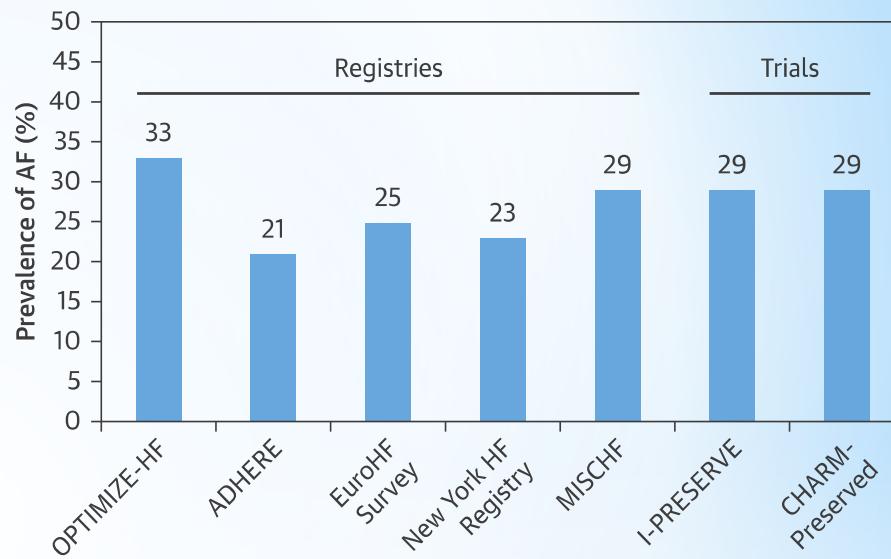


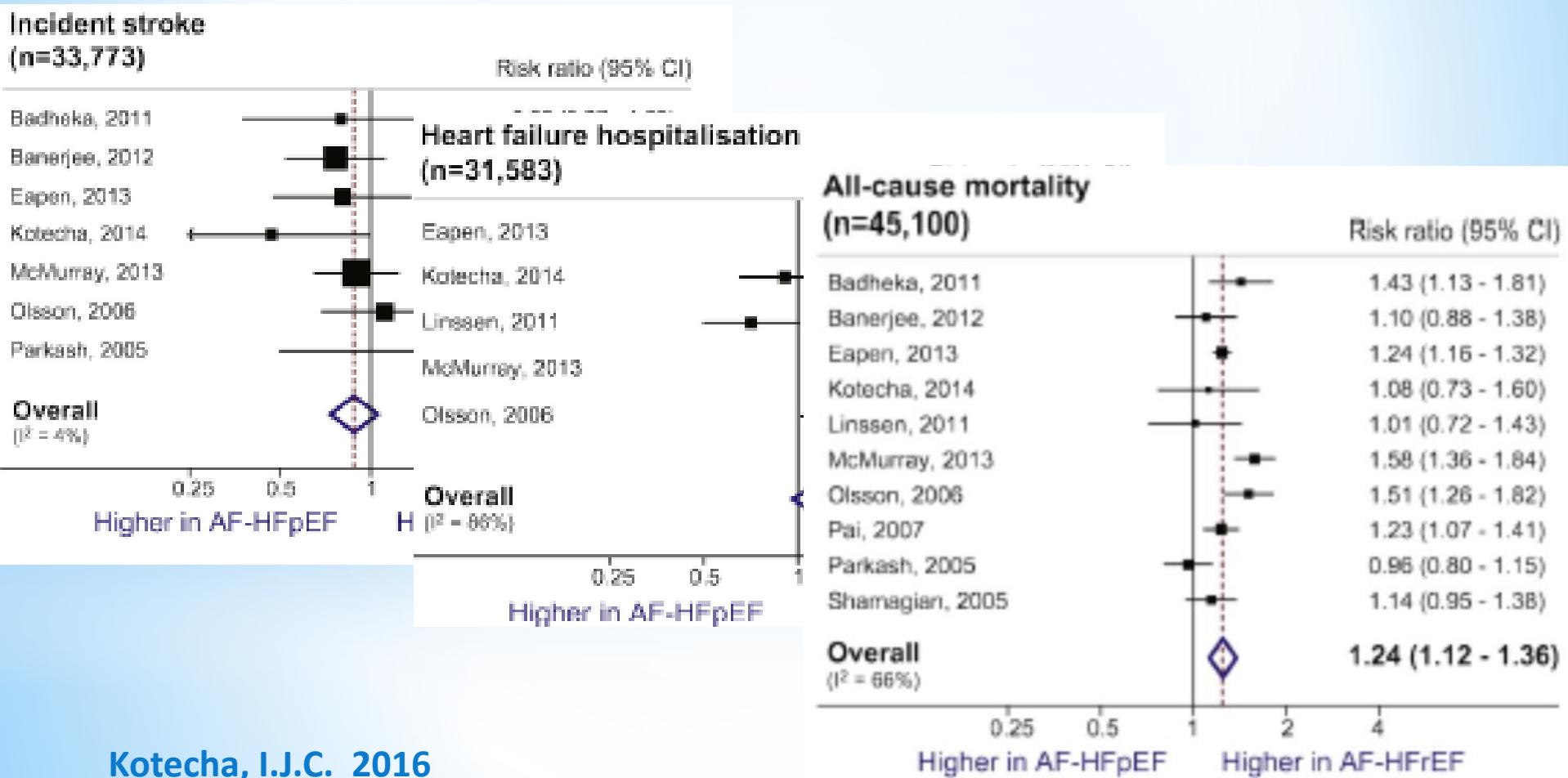
FIGURE 2 Prevalence of AF in HFpEF



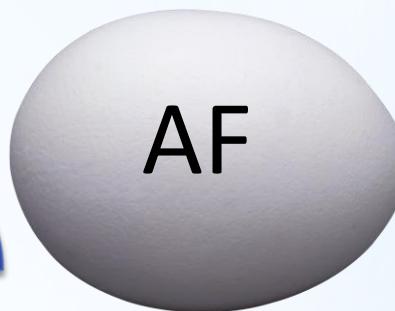
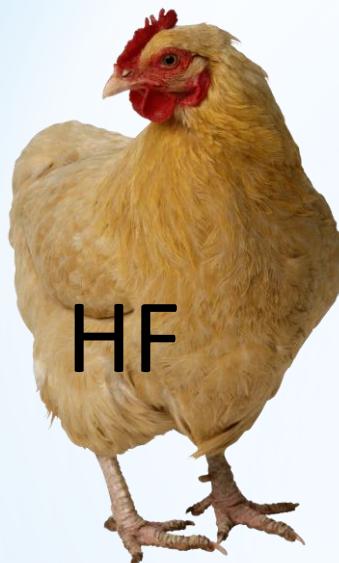
Atrial fibrillation and heart failure due to reduced versus preserved ejection fraction: A systematic review and meta-analysis of death and adverse outcomes

Dipak Kotecha *, Rajiv Chudasama, Deirdre A. Lane, Paulus Kirchhof, Gregory Y.H. Lip

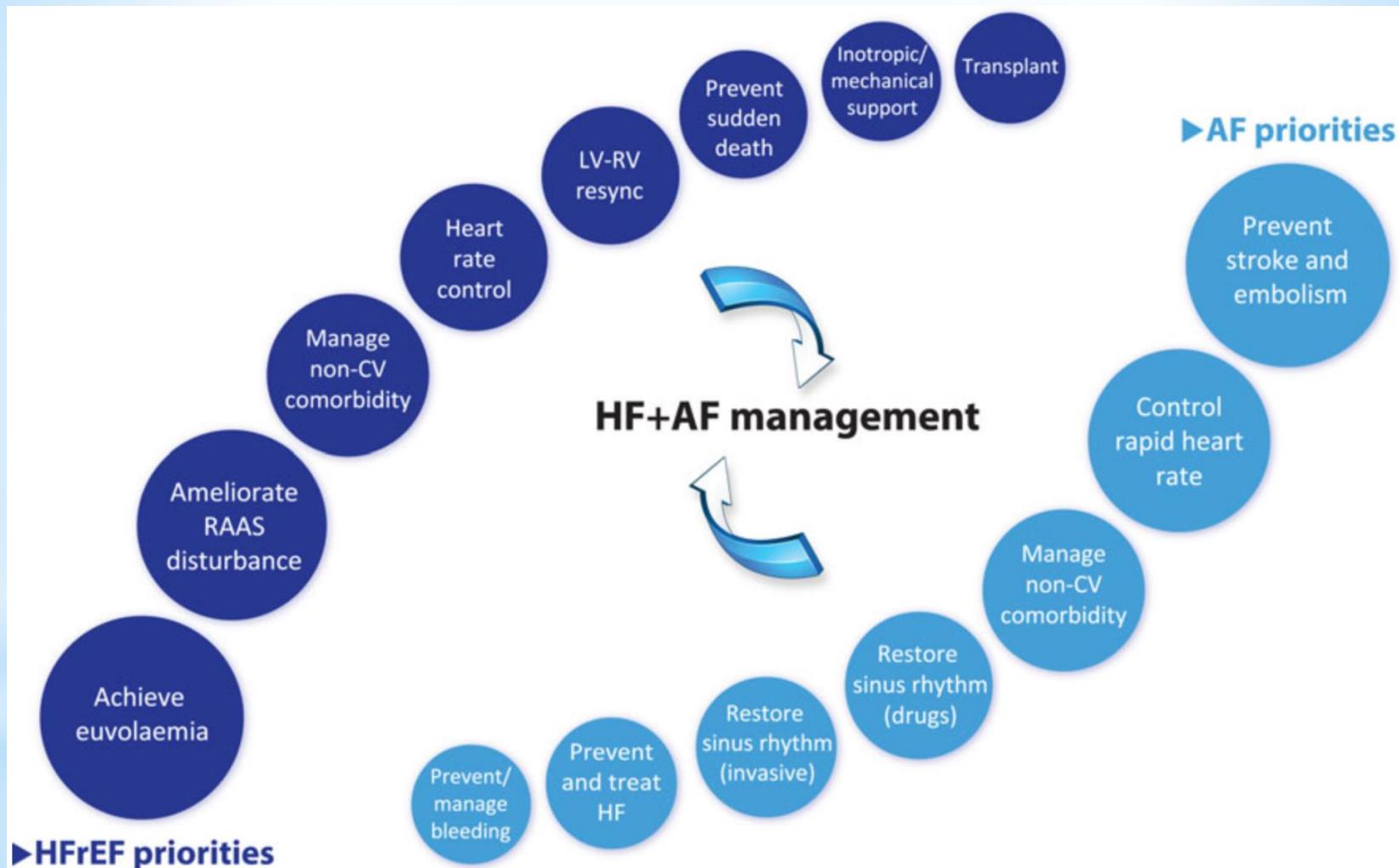
University of Birmingham Institute for Cardiovascular Sciences, The Medical School, Birmingham, B15 2TT, UK



The best treatment of HF+AF



Management of concomitant heart failure and atrial fibrillation



Atrial fibrillation in heart failure: what should we do?

Dipak Kotecha and Jonathan P. Piccini.
European Heart Journal (2015) 36, 3250-3257

Management of concomitant heart failure and atrial fibrillation

CAN-TREAT HFrEF+AF

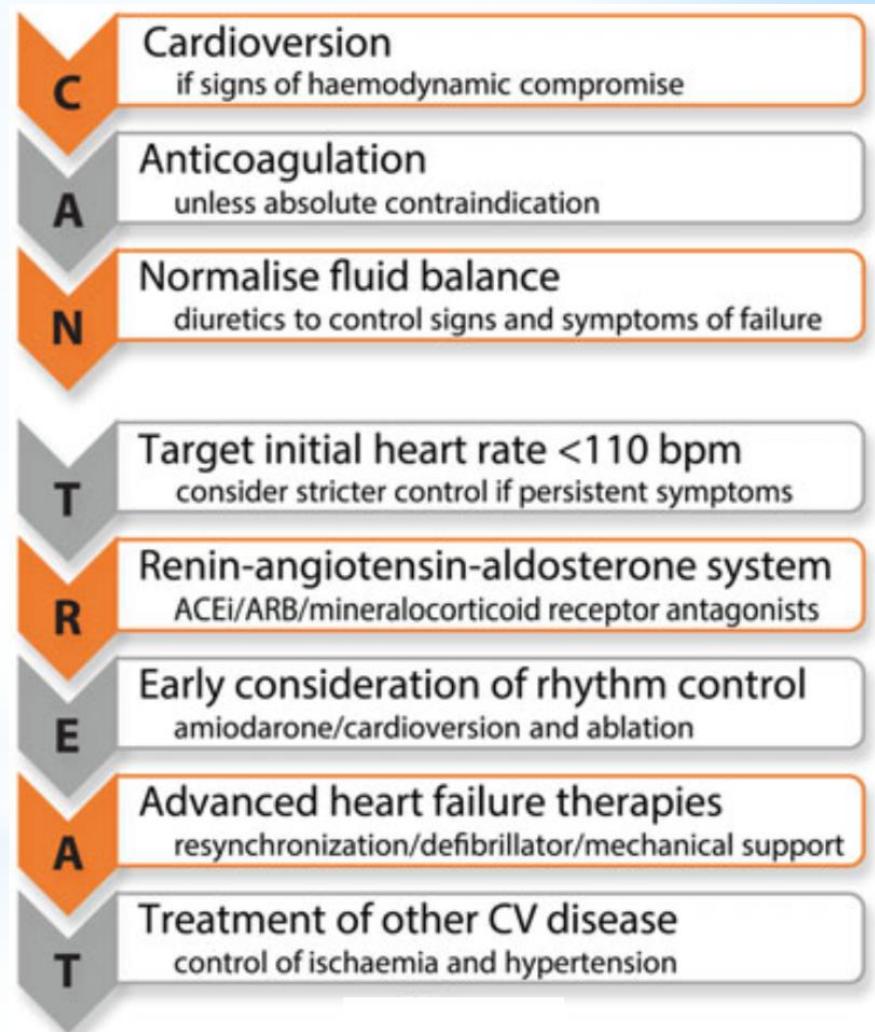
Management of newly diagnosed concomitant heart failure with reduced ejection fraction and atrial fibrillation



Patient-centred approach

Diagnosis/management of non-CV comorbidities, including diabetes, renal dysfunction, anaemia and airways disease

Education and support



Atrial fibrillation in heart failure: what should we do?

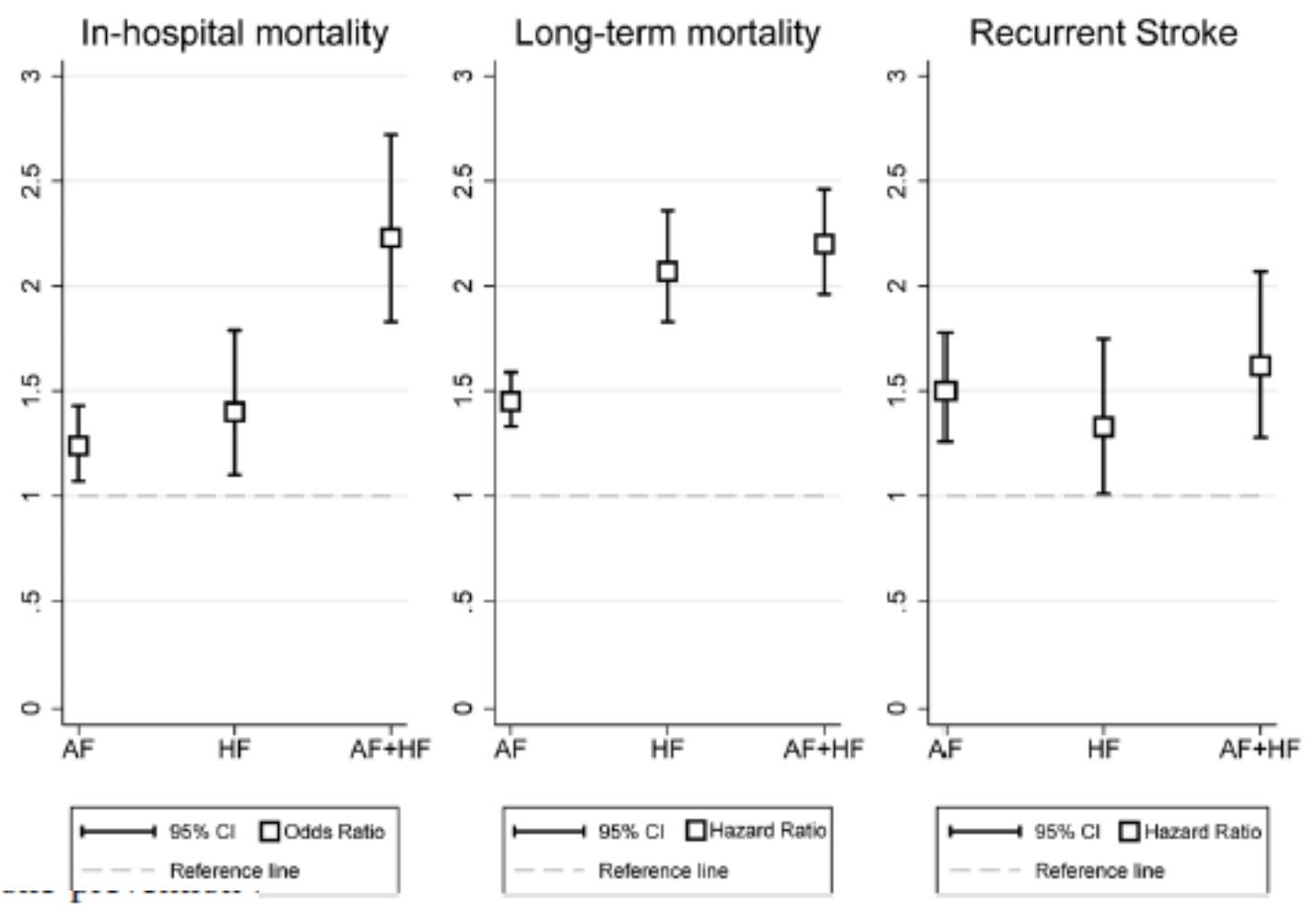
Dipak Kotecha and Jonathan P. Piccini.
European Heart Journal (2015) 36, 3250-3257

OAT

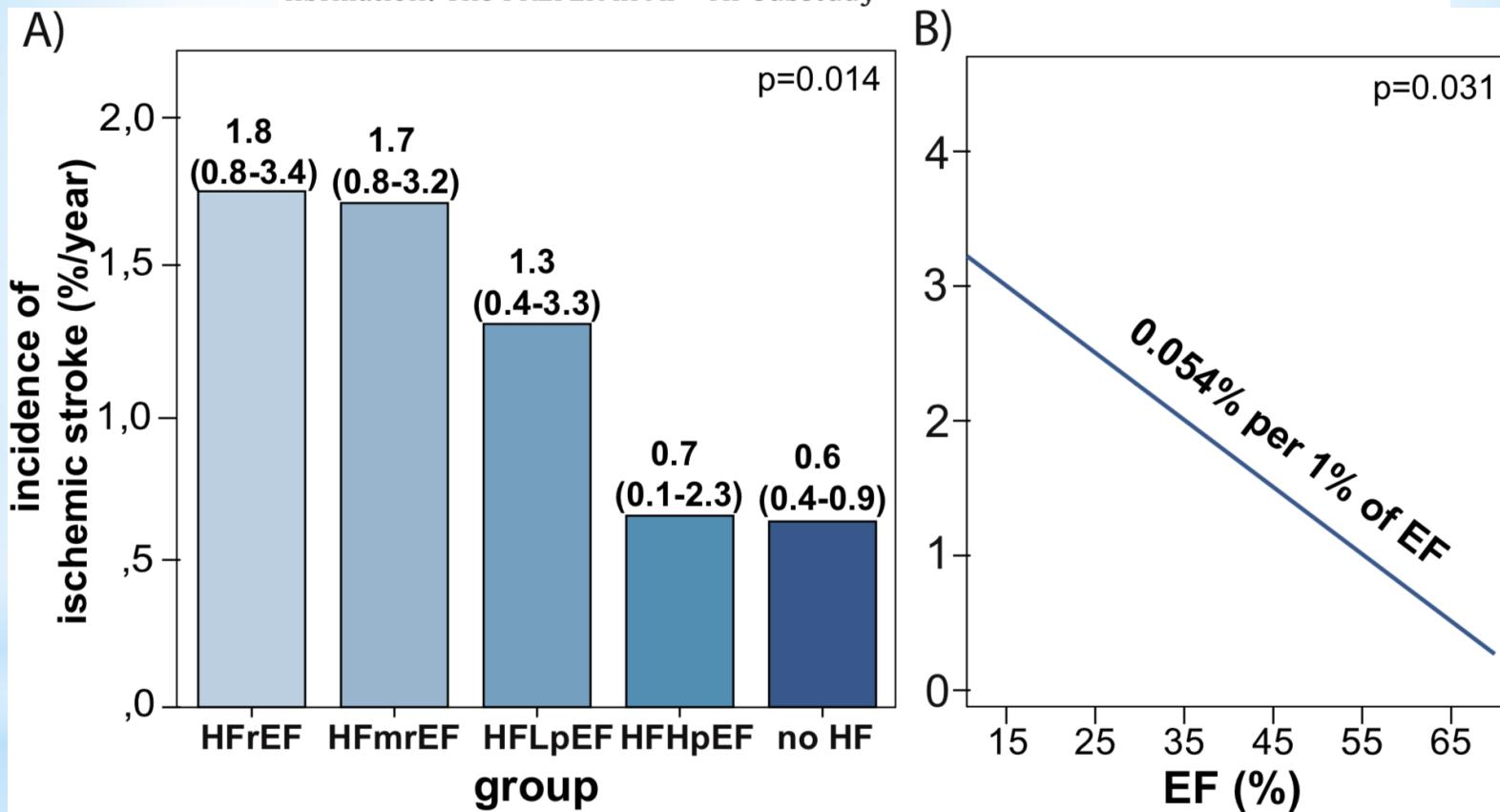
Individual and Combined Impact of Heart Failure and Atrial Fibrillation on Ischemic Stroke Outcomes

A Prospective Hospital Register Cohort Study

Tiberiu A. Pana; David J. McLernon, PhD; Mamas A. Mamas, MD;
Joao H. Bettencourt-Silva, PhD; Anthony K. Metcalf, MD; John F. Potter, MD; Phyo K. Myint, MD



Heart failure subtypes and thromboembolic risk in patients with atrial fibrillation: The PREFER in AF - HF substudy



A) Annual incidence of ischemic stroke; B) Linear regression model for the association between the incidence of ischemic stroke and ejection fraction (EF).



2016 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure

The Task Force for the diagnosis and treatment of acute and chronic heart failure of the European Society of Cardiology (ESC)

Recommendations for the prevention of thrombo-embolism in patients with symptomatic heart failure (NYHA Class II-IV) and paroxysmal or persistent/permanent atrial fibrillation

Recommendations	Class ^a	Level ^b	Ref ^c
The CHA ₂ DS ₂ -VASc and HAS-BLED scores are recommended tools in patients with HF for the estimation of the risk of thromboembolism and the risk of bleeding associated with oral anticoagulation, respectively.	I	B	376, 377
An oral anticoagulant is recommended to prevent thrombo-embolism for all patients with paroxysmal or persistent/permanent AF and a CHA ₂ DS ₂ -VASc score ≥2, without contra-indications, and irrespective of whether a rate or rhythm management strategy is used (including after successful cardioversion).	I	A	372-375, 378, 379
NOAC treatment is contra-indicated in patients with mechanical valves or at least moderate mitral stenosis.	III	B	380
In patients with AF of ≥48 h duration, or when the duration of AF is unknown, an oral anticoagulant is recommended at a therapeutic dose for ≥3 weeks prior to electrical or pharmacological cardioversion.	I	B	
Intravenous heparin or LMWH and TOE guided strategy is recommended for patients who have not been treated with an anticoagulant dose for ≥3 weeks and require urgent electrical or pharmacological cardioversion for a life threatening arrhythmia.	I	C	
Combination of an oral anticoagulant and an antiplatelet agent is not recommended in patients with chronic (>12 months after an acute event) coronary or other arterial disease, because of a high-risk of serious bleeding. Single therapy with an oral anticoagulant is preferred after 12 months.	III	C	
For patients with HF and non-valvular AF eligible for anticoagulation based on a CHA ₂ DS ₂ -VASc score, NOACs rather than warfarin should be considered for anticoagulation as NOACs are associated with a lower risk of stroke, intracranial haemorrhage and mortality, which outweigh the increased risk of gastrointestinal haemorrhage.	IIa	B	

RHYTHM CONTROL

FARMACI

2016 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure

The Task Force for the diagnosis and treatment of acute and chronic heart failure of the European Society of Cardiology (ESC)

Recommendations for a rhythm control management strategy in patients with atrial fibrillation, symptomatic heart failure (NYHA Class II–IV) and left ventricular systolic dysfunction and no evidence of acute decompensation

Recommendations	Class ^a	Level ^b	Ref. ^c
Electrical cardioversion or pharmacological cardioversion with amiodarone may be considered in patients with persisting symptoms and/or signs of HF, despite OMT and adequate control of ventricular rate, to improve clinical/symptomatic status.	IIIb	B	344
AF ablation may be considered in patients with sinus rhythm to improve symptoms in patients with persisting symptoms and/or signs of HF, despite OMT and adequate control of ventricular rate, to improve clinical/symptomatic status.	IIIb	B	279, 363
Amiodarone may be considered (and followed) after successful electrical cardioversion to maintain sinus rhythm.	IIIb	B	342, 360
Dronedarone is not recommended because of increased risk of hospital admissions for cardiovascular causes and an increased risk of premature death in NYHA Class III–IV patients.	III	A	247, 347
Class I antiarrhythmic agents are not recommended because of an increased risk of premature death.	III	A	248, 364, 365

Table 2 Antiarrhythmic drug therapy for atrial fibrillation in heart failure

Guidelines	Agent	Class	Safety	Efficacy
Recommended	Amiodarone	Mixed channel blockade	Risks of toxicity, including thyroid, hepatic, pulmonary, and neurological. ⁷⁸	Superior efficacy for maintenance of sinus rhythm vs. placebo: odds ratio 0.15 (95% CI 0.10–0.22). ⁷⁹
Caution required	Dofetilide	III	Requires inpatient stay for loading. Risk of torsades 0.8–3.3%. Not approved in EU.	Lower risk of all-cause rehospitalization in patients with AF at baseline vs. placebo: relative risk 0.70 (95% CI 0.56–0.89). ⁸⁰
	Dronedarone	Mixed channel blockade	Increased mortality in patients with HF and permanent AF. ^{15,81}	Decreased risk of CV hospitalization or death in patients with AF and no recent HF decompensation vs. placebo: 0.76 (95% CI 0.69–0.84). ⁸²
	Sotalol	III	Concern for excess proarrhythmia in patients with acute myocardial infarction or LVEF \leq 40%: relative risk 1.65 (95% CI 1.15–2.36) for all-cause mortality. ^{83a}	Sotalol was inferior to amiodarone in patients with AF (28% had NYHA class I/II HF). ⁸⁴
Contraindicate	Flecainide and Propafenone	I	Flecainide, encainide and moracizine increased mortality in patients with myocardial infarction. ⁸⁵ Propafenone can precipitate decompensated HF, particularly in CYP 2D6 slow-metabolizers.	

^aSWORD evaluated D-sotalol rather than D,L-sotalol.

RHYTHM CONTROL

ABLAZIONE

Table 2. Summary of Randomized Trials of Catheter Ablation of Atrial Fibrillation in Patients With Heart Failure

	Sample Size	Age, y	NICM, %	Comparator Arm	LVEF, %	Follow-Up, mo	Single-Procedure Success, %	Multiprocedure Success, %	LVEF Improvement, %	Other Comments
Khan 2008 ⁸⁴	81 (41)	60	27	AV nodal ablation + BIV pacing	27	6	68	88	+8	Improved 6MHW and Minnesota score
MacDonald 2011 ¹¹⁶	41 (22)	62	37	Medical rate control	36	12	40	50	+4	No difference vs rate control, high complication rate
Jones 2013 ¹¹⁷	52 (26)	63	73	Medical rate control	22	12	68	88	+11	Minnesota score, BNP, and peak oxygen consumption improved
Hunter 2014 ¹¹⁸	366 (67)	54	82	Medical rate control	42	20	38	81	+8	Minnesota score and peak oxygen consumption improved
Di Biase 2016 ¹¹⁹	203 (102)	62	38	Amiodarone	29	24	—	70	+8	1.4 procedures per patient, 6MHW, Minnesota score, hospitalization and death improved by ablation



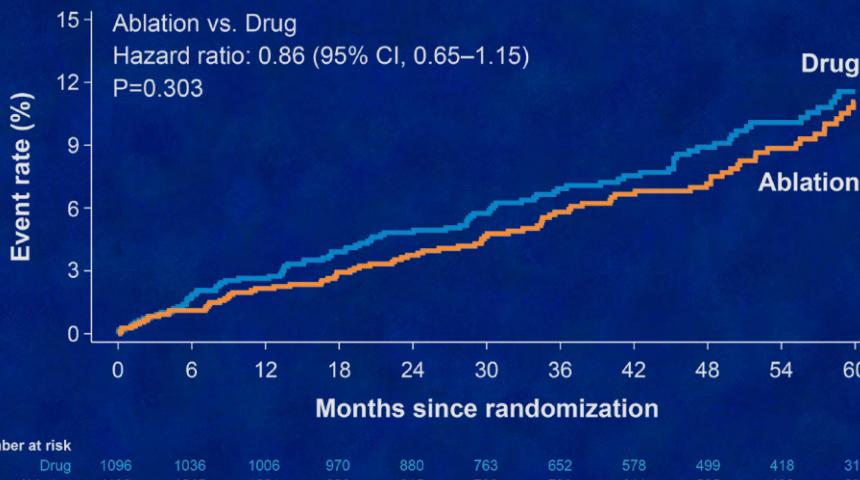
Catheter Ablation vs Antiarrhythmic Drug Therapy in Atrial Fibrillation (CABANA) Trial

Douglas L. Packer MD, Kerry L. Lee PhD,
Daniel B. Mark MD, MPH, Richard A. Robb PhD
for the CABANA Investigators

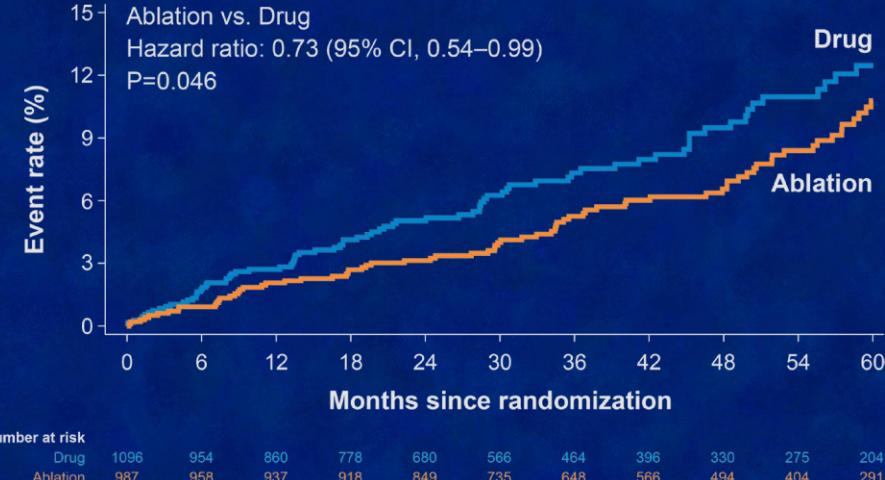
Mayo Clinic Rochester
Duke Clinical Research Institute
National Heart, Lung, and Blood Institute



Primary Endpoint (Death, Disabling Stroke, Serious Bleeding, or Cardiac Arrest) (ITT)



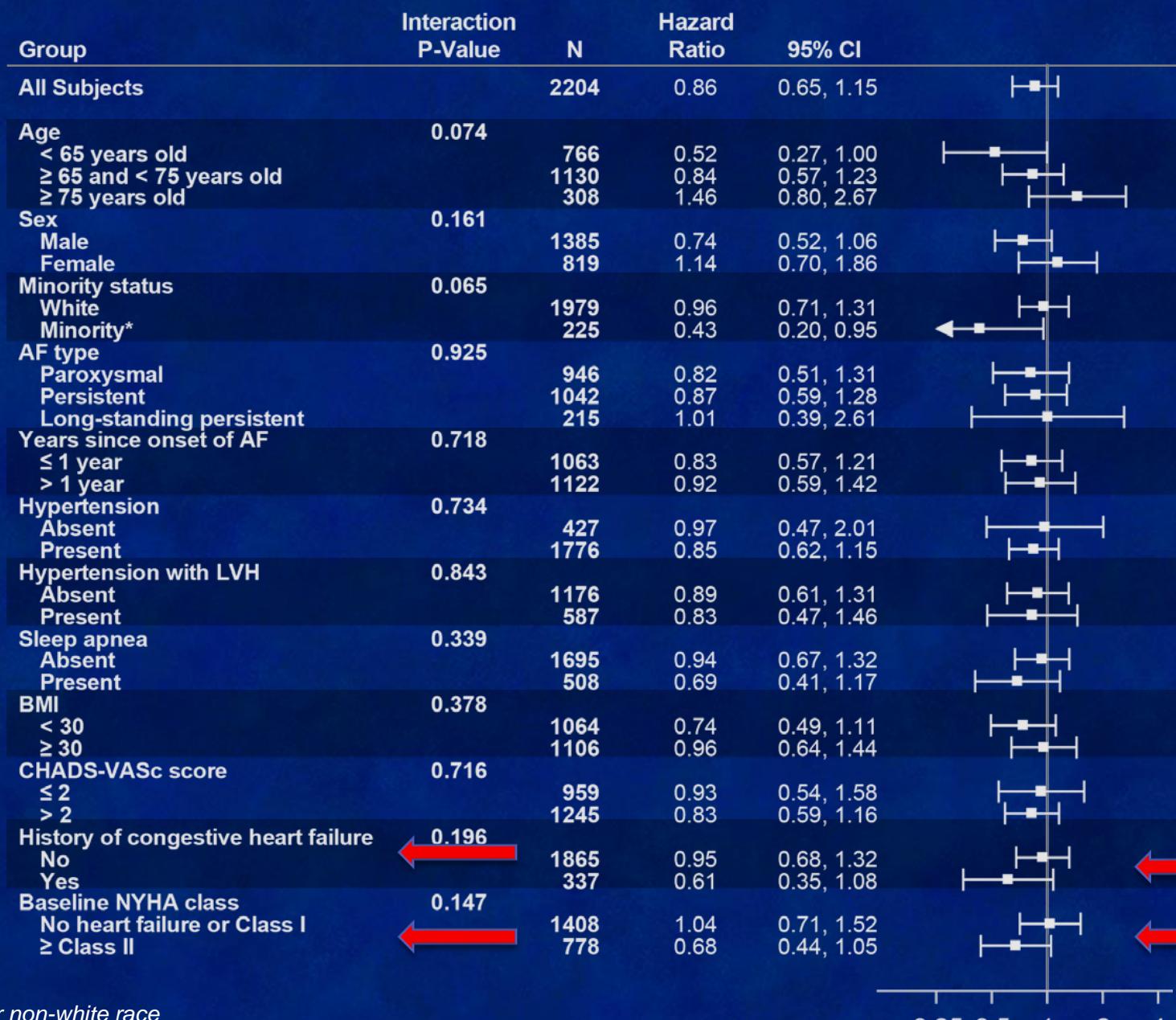
Primary Endpoint (Death, Disabling Stroke, Serious Bleeding, or Cardiac Arrest) (Per Protocol)





Primary Endpoint Sub-group Analysis

All-Cause Mortality, Disabling Stroke, Serious Bleeding, Cardiac Arrest (ITT)

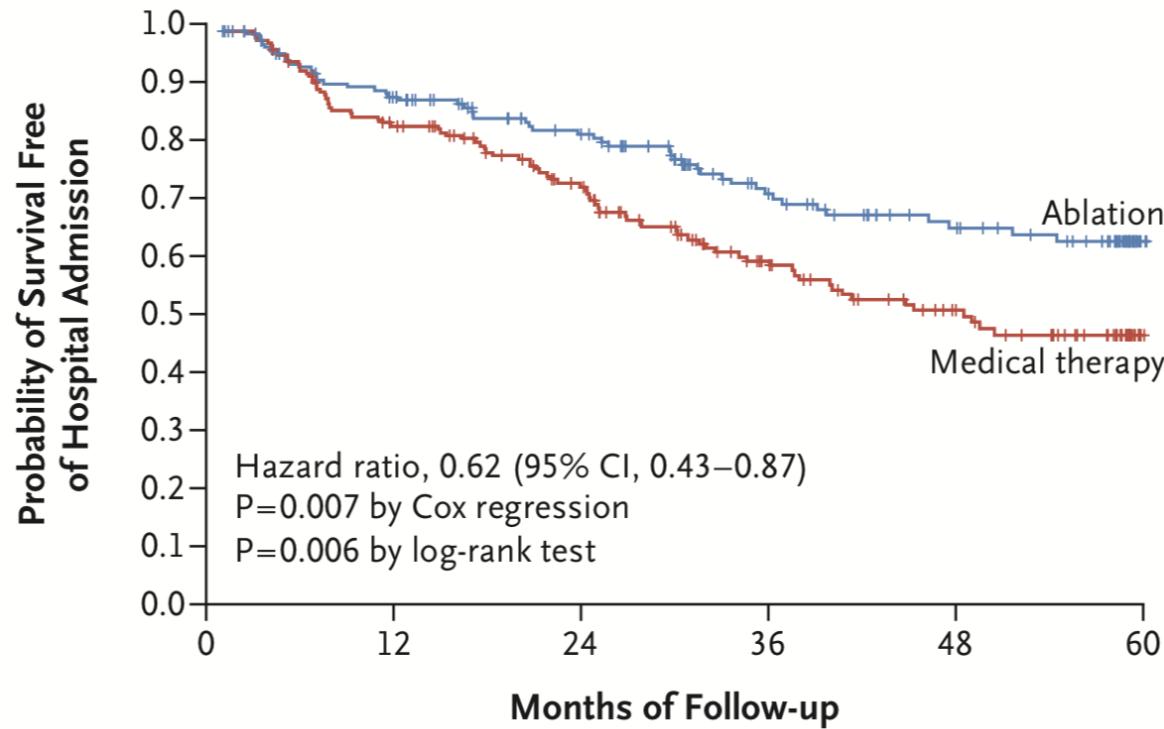


* Minority=Hispanic or Latino or non-white race

Catheter Ablation for Atrial Fibrillation with Heart Failure

Nassir F. Marrouche, M.D., Johannes Brachmann, M.D., Dietrich Andresen, M.D., Jürgen Siebels, M.D.,
Lucas Boersma, M.D., Luc Jordae, M.D., Béla Merkely, M.D., Evgeny Pokushalov, M.D.,
Prashanthan Sanders, M.D., Jochen Proff, B.S., Heribert Schunkert, M.D., Hildegard Christ, M.D.,
Jürgen Vogt, M.D., and Dietmar Bänsch, M.D., for the CASTLE-AF Investigators*

A Death or Hospitalization for Worsening Heart Failure



No. at Risk

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

The NEW ENGLAND JOURNAL of MEDICINE

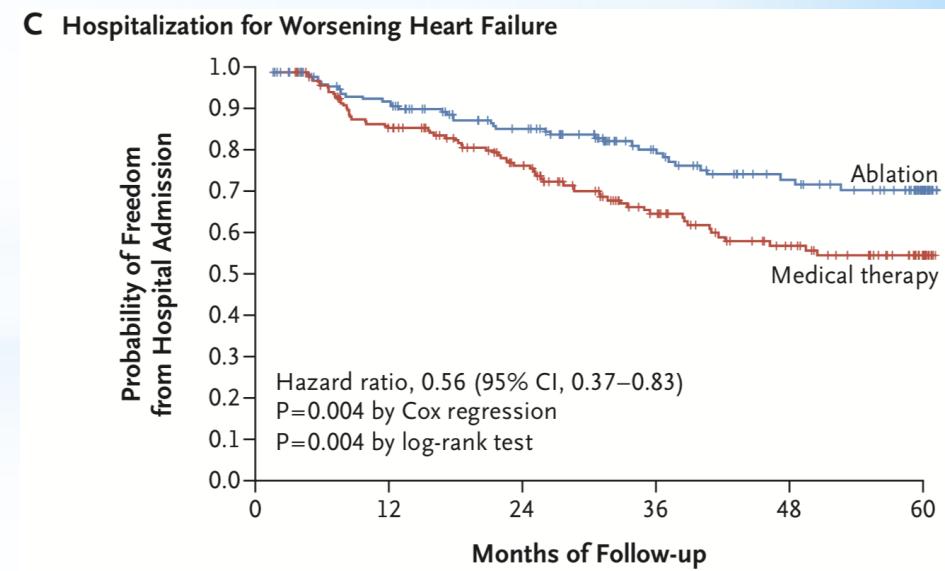
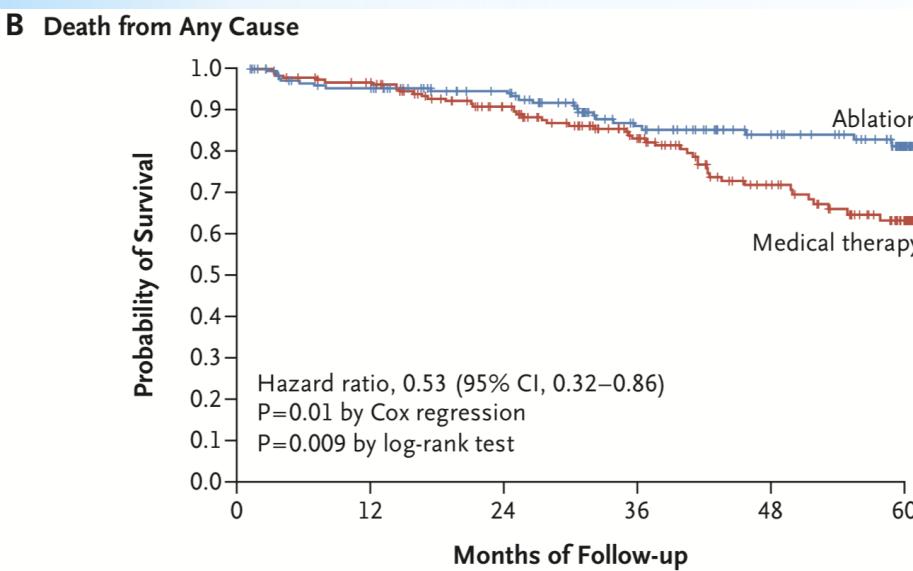
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Catheter Ablation for Atrial Fibrillation with Heart Failure

Nassir F. Marrouche, M.D., Johannes Brachmann, M.D., Dietrich Andresen, M.D., Jürgen Siebels, M.D.,
Lucas Boersma, M.D., Luc Jordaens, M.D., Béla Merkely, M.D., Evgeny Pokushalov, M.D.,
Prashanthan Sanders, M.D., Jochen Proff, B.S., Heribert Schunkert, M.D., Hildegard Christ, M.D.,
Jürgen Vogt, M.D., and Dietmar Bänsch, M.D., for the CASTLE-AF Investigators*



No. at Risk

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

No. at Risk

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

RATE CONTROL

FARMACI

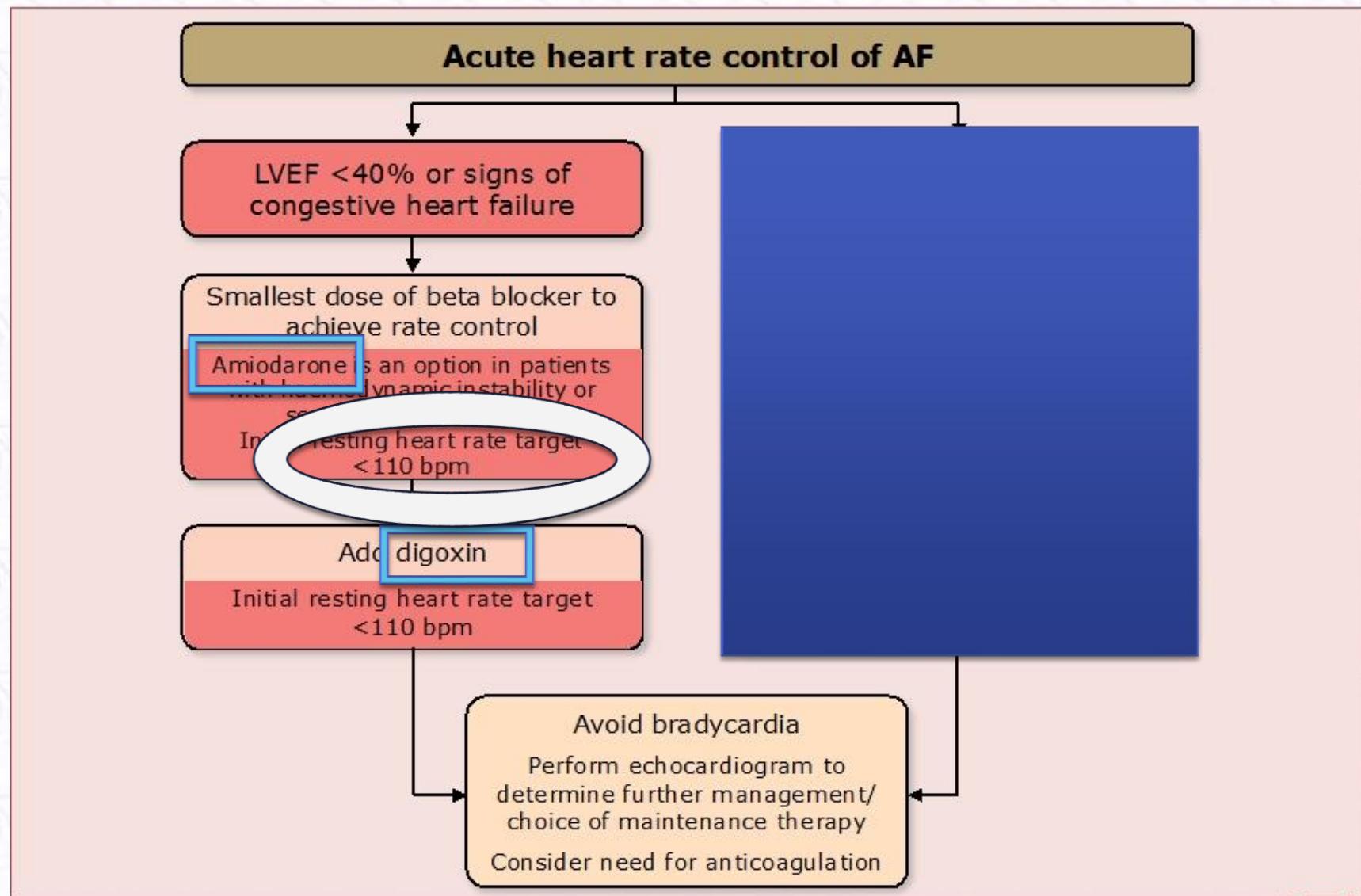
2016 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure

The Task Force for the diagnosis and treatment of acute and chronic heart failure of the European Society of Cardiology (ESC)

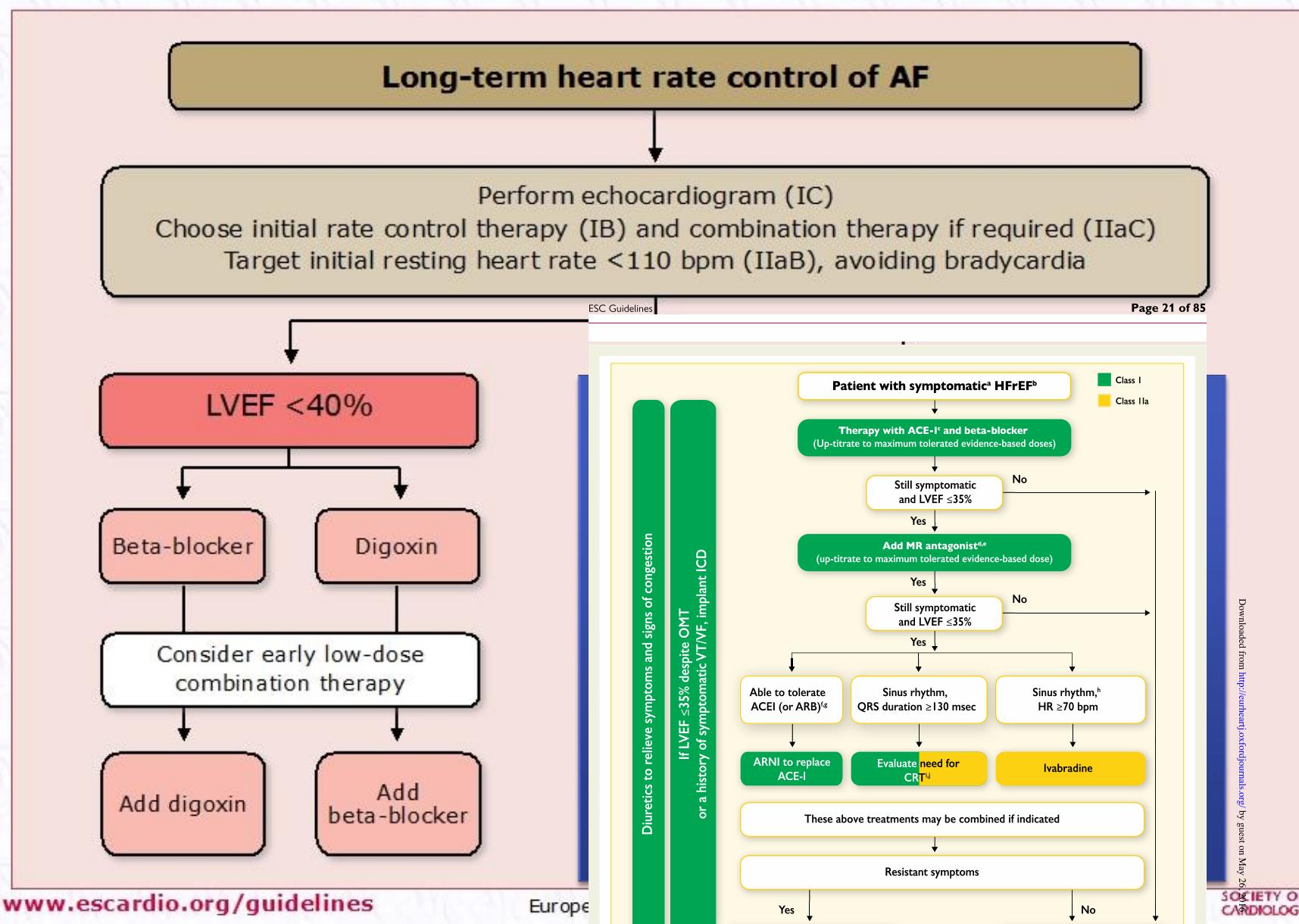
Recommendations for initial management of a rapid ventricular rate in patients with heart failure and atrial fibrillation in the acute or chronic setting

Recommendations	Class ^a	Level ^b	Ref ^c
Urgent electrical cardioversion is recommended if AF is thought to be contributing to the patient's haemodynamic compromise in order to improve the patient clinical condition.	I	C	
For patients in NYHA Class IV, in addition to treatment for AHF, an intravenous bolus of amiodarone or, in digoxin-naïve patients, an intravenous bolus of digoxin should be considered to reduce the ventricular rate.	IIa	B	348, 349
For patients in NYHA Class I–III, a beta-blocker, usually given orally, is safe and therefore is recommended as first-line treatment to control ventricular rate, provided the patient is euvolaemic.	I	A	177
For patients in NYHA Class I–III, digoxin, should be considered when ventricular rate remains high ^d despite beta-blockers or when beta-blockers are not tolerated or contra-indicated.	IIa	B	197
AV node catheter ablation may be considered to control heart rate and relieve symptoms in patients unresponsive or intolerant to intensive pharmacological rate and rhythm control therapy, accepting that these patients will become pacemaker dependent.	IIb	B	290
Treatment with dronedarone to improve ventricular rate control is not recommended due to safety concerns.	III	A	347

Acute heart rate control in atrial fibrillation

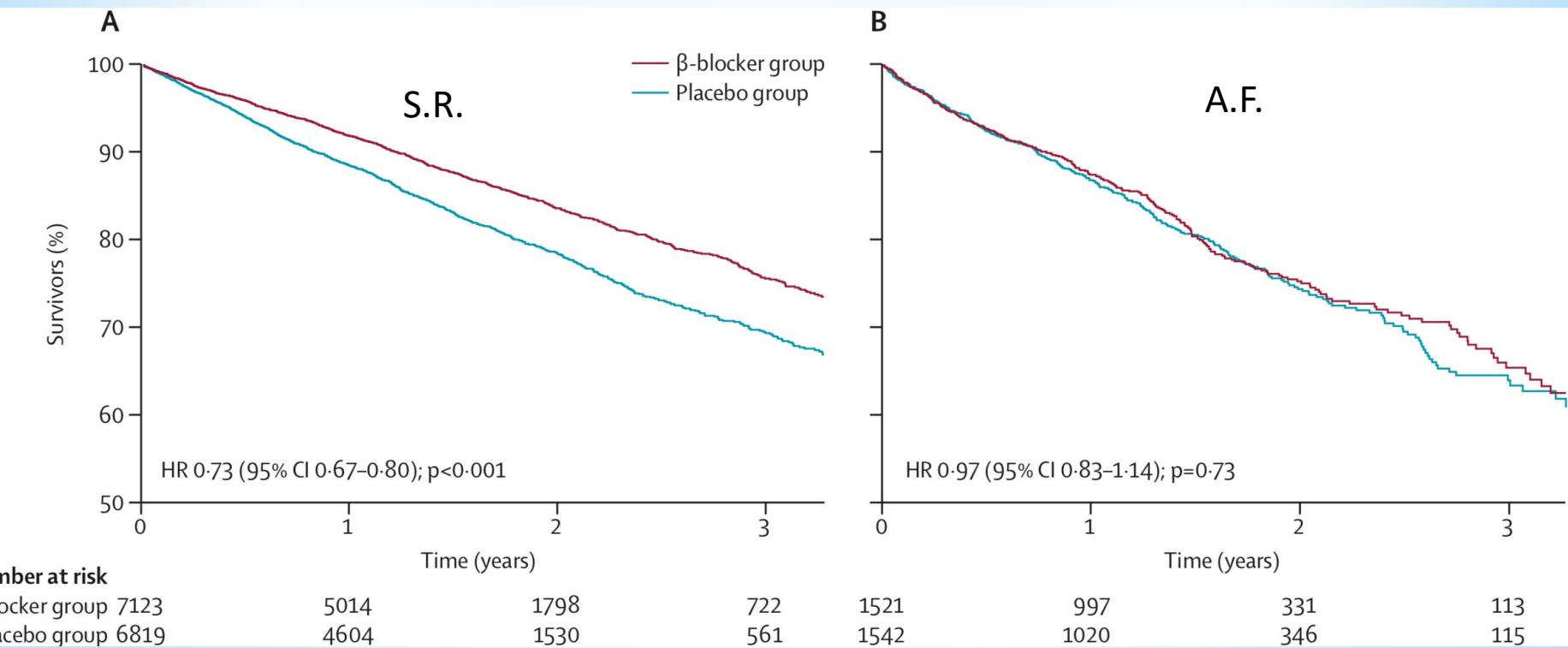


Long-term heart rate control in patients with atrial fibrillation



Efficacy of β blockers in patients with heart failure plus atrial fibrillation: an individual-patient data meta-analysis

Dipak Kotecha, Jane Holmes, Henry Krum, Douglas G Altman, Luis Manzano, John G Cleland, Gregory Y H Lip, Andrew J S Coats, Bert Andersson, Paulus Kirchhof, Thomas G von Lueder, Hans Wedel, Giuseppe Rosano, Marcelo C Shibata, Alan Rigby, Marcus D Flather, on behalf of the Beta-Blockers in Heart Failure Collaborative Group



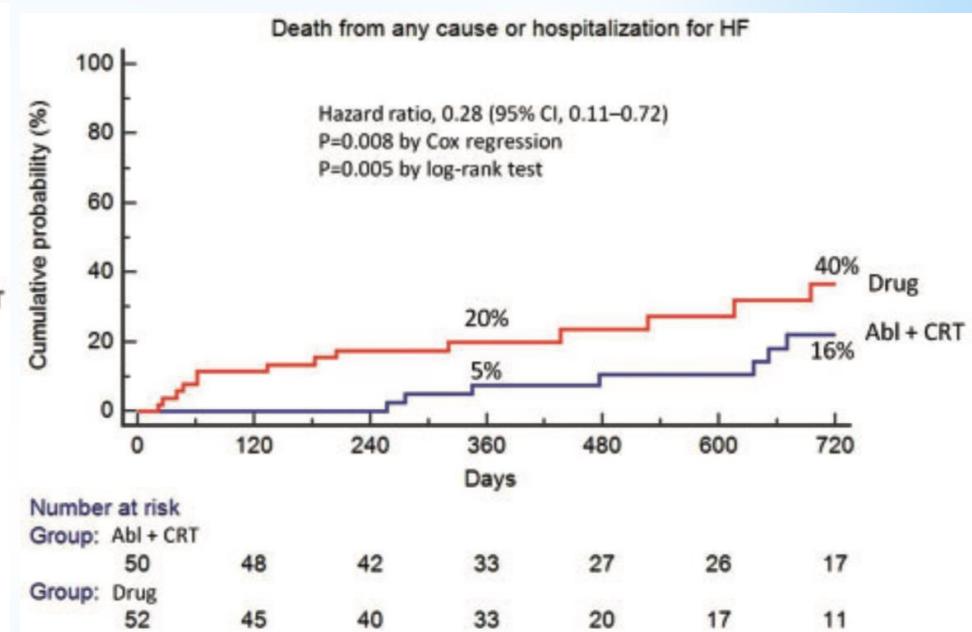
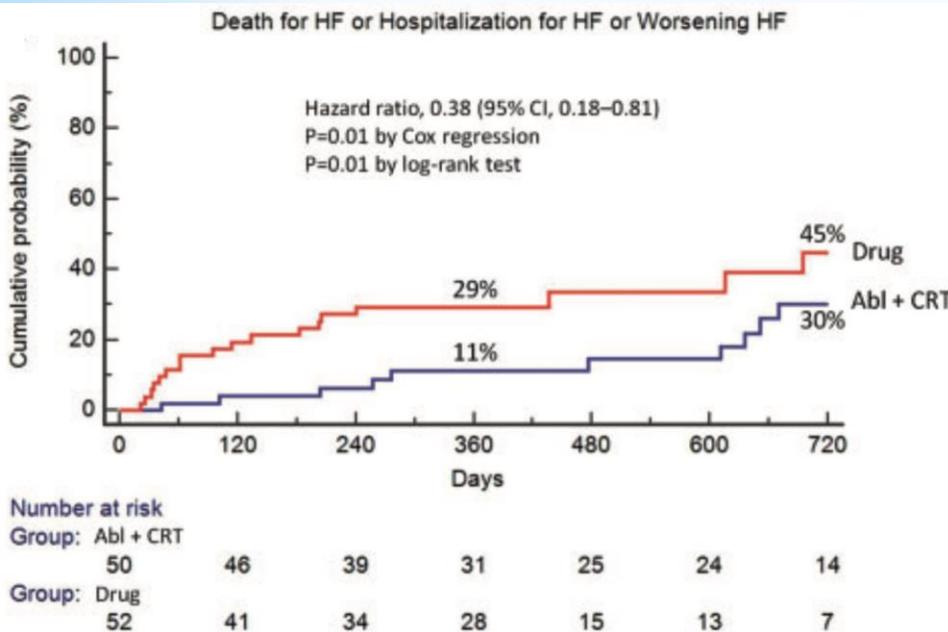
Kaplan-Meier survival curve for patients with sinus rhythm (A) and atrial fibrillation (B) in the β -blocker and placebo groups.

RATE CONTROL
ABLATE and PACE

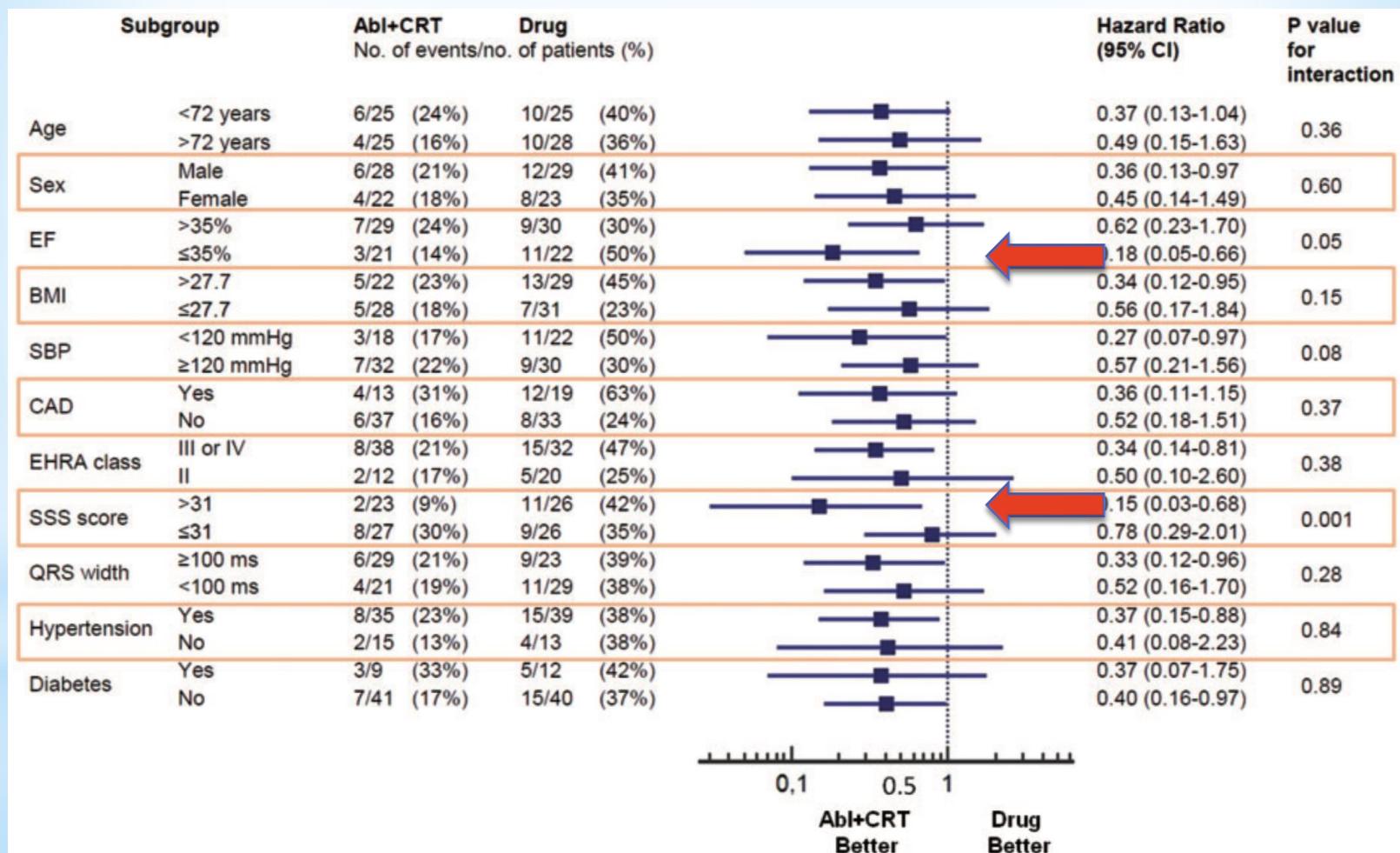
A randomized controlled trial of atrioventricular junction ablation and cardiac resynchronization therapy in patients with permanent atrial fibrillation and narrow QRS



APAF CRT

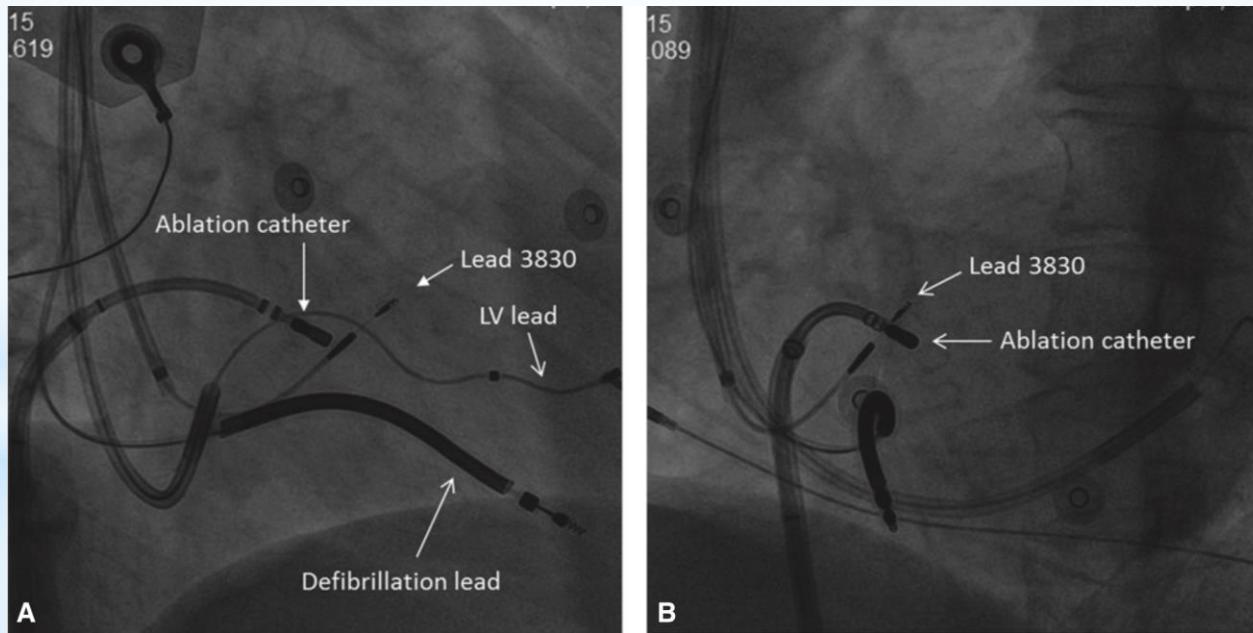


A randomized controlled trial of atrioventricular junction ablation and cardiac resynchronization therapy in patients with permanent atrial fibrillation and narrow QRS



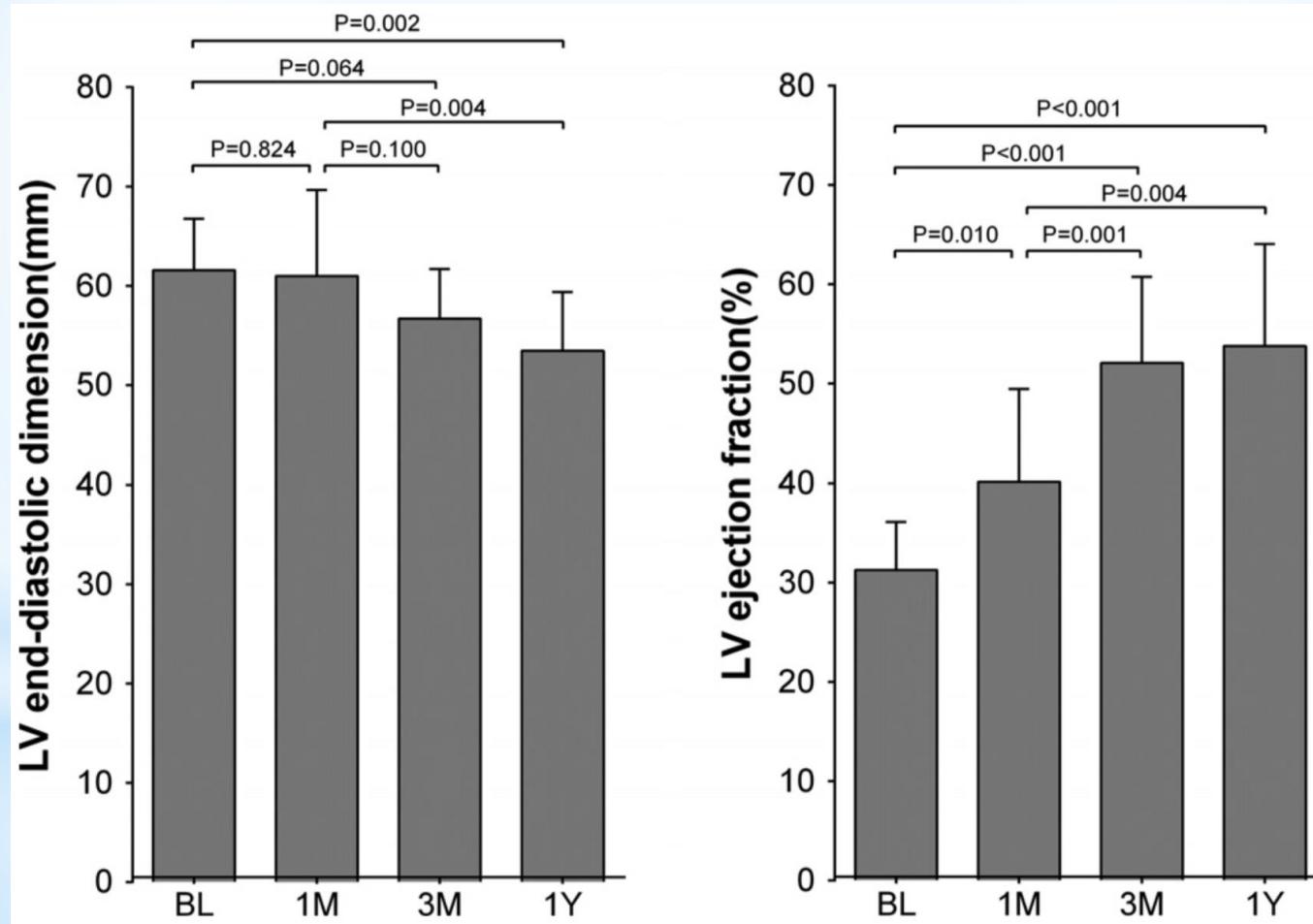
Benefits of Permanent His Bundle Pacing Combined With Atrioventricular Node Ablation in Atrial Fibrillation Patients With Heart Failure With Both Preserved and Reduced Left Ventricular Ejection Fraction

Weijian Huang, MD; Lan Su, MD; Shengjie Wu, MD; Lei Xu, MD; Fangyi Xiao, MD; Xiaohong Zhou, MD; Kenneth A. Ellenbogen, MD



Benefits of Permanent His Bundle Pacing Combined With Atrioventricular Node Ablation in Atrial Fibrillation Patients With Heart Failure With Both Preserved and Reduced Left Ventricular Ejection Fraction

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CONCLUSIONI 1

- Fibrillazione atriale e Scompenso condividono alcuni meccanismi fisiopatologici; pertanto, spesso coesistono.
- Se ambedue presenti l'interazione dei processi fisiopatologici ne favorisce il progressivo aggravamento.
- La strategia “rate control” equivale a quella “rhythm control” con farmaci.

CONCLUSIONI 2

Rhythm Control

- **Amiodarone** è l'unico antiaritmico consentito (+Dofetilide in USA).
- **L'ablazione** dell'atrio sinistro migliora la qualità di vita, la funzione ventricolare e la sopravvivenza.

Ma:

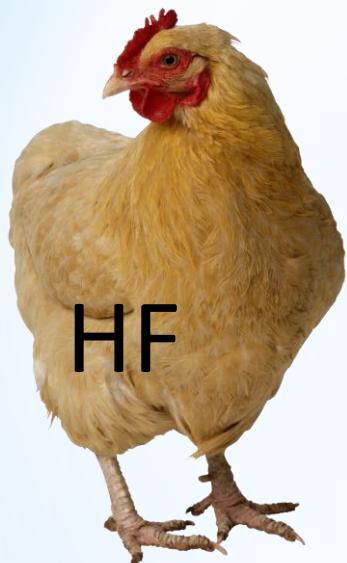
- richiede **ripetute procedure** in un significativo numero di pazienti.
- espone a potenziali serie **complicazioni**
- non sono noti i risultati a **lungo termine**

CONCLUSIONS III

Rate Control

- **Betabloccanti** terapia di prima scelta (+ digossina e/o amiodarone in specifiche condizioni)
- **Ablate and pace** (CRT or HB) determina miglioramenti della qualità di vita e della funzione ventricolare.

The association between AF and HFrEF



GRAZIE

