

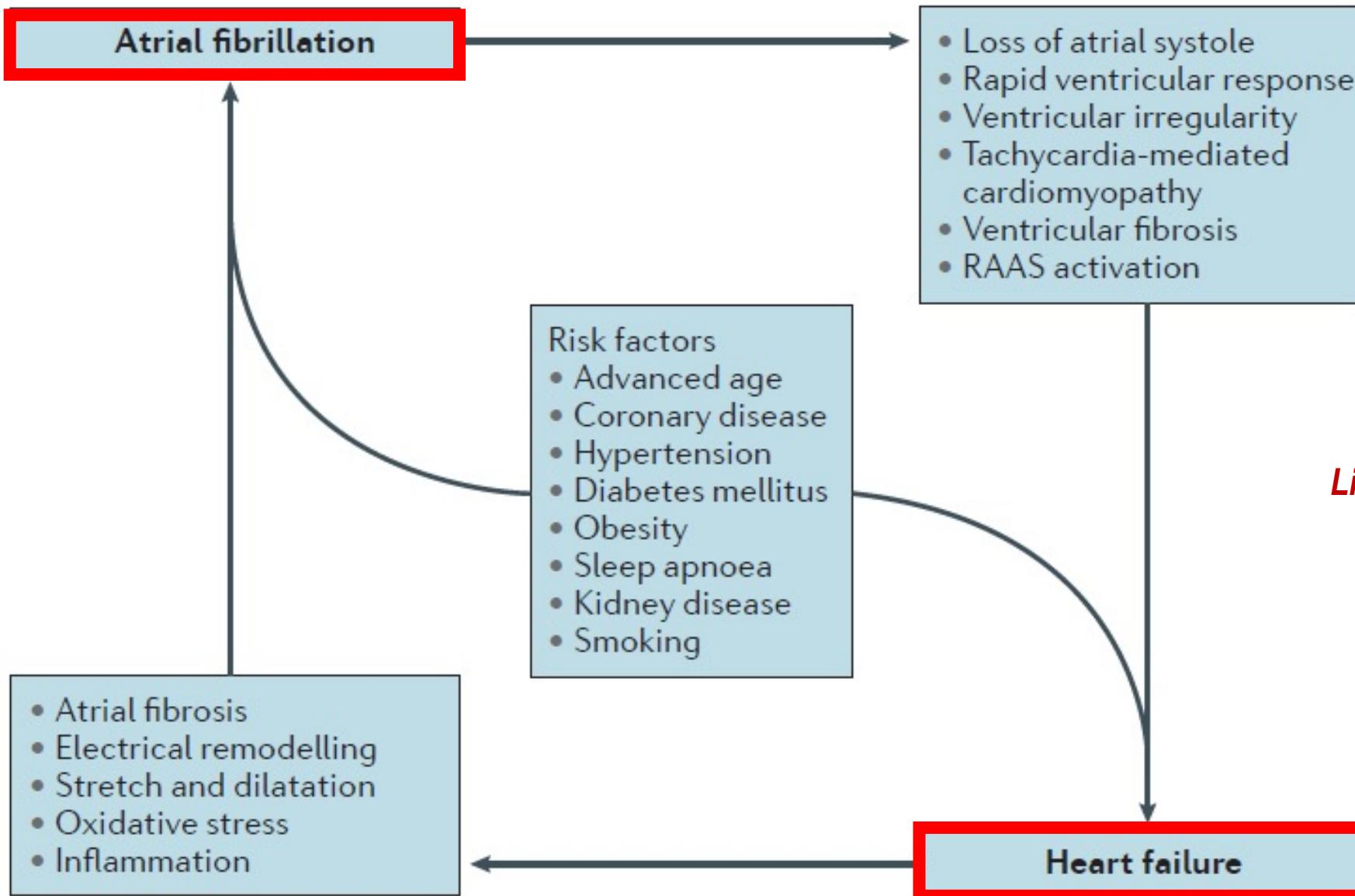
# Insuffisance cardiaque et Fibrillation Atriale

## Quelle prise en charge ?

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CHU de Rouen*

**CARDIORUN 2021**

# Pathophysiological interactions between AF and HF



Ling LH, et al. *Nature Reviews Cardiology* 2016;13:131-47

# Prevalence of AF in selected trials of patients with HF

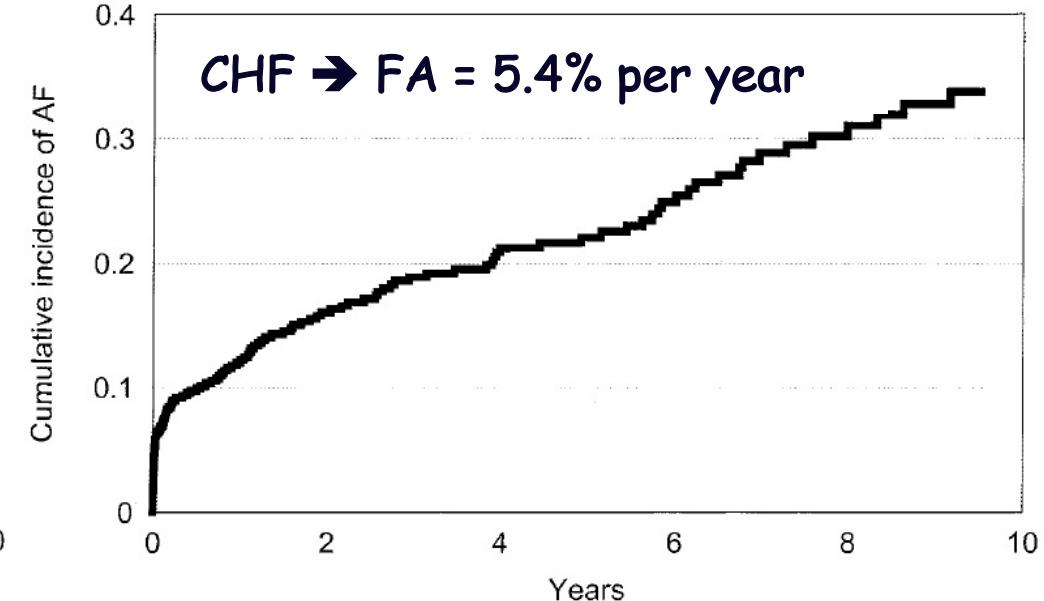
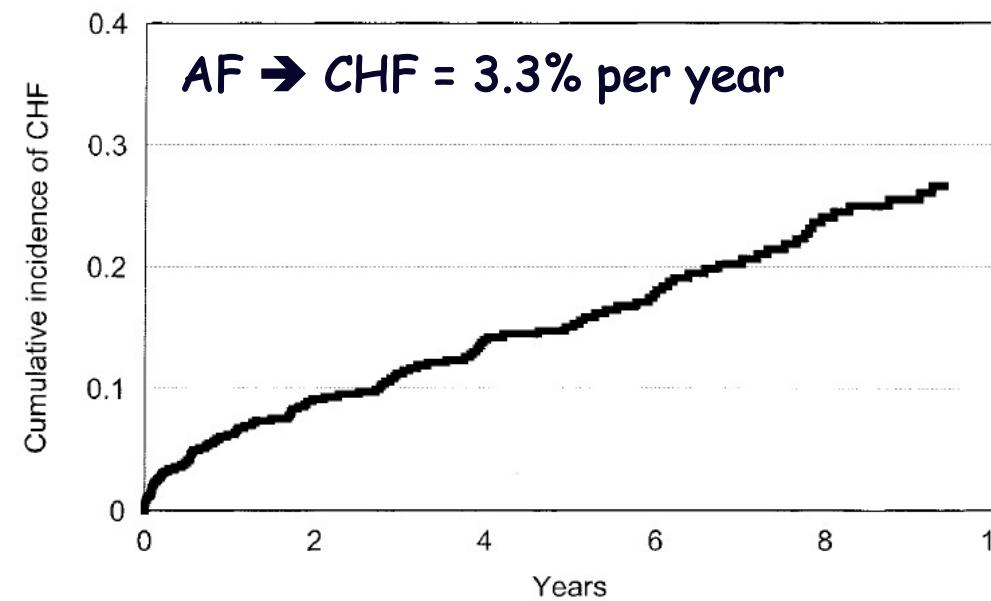
Trial	Year published	n	AF prevalence (%)	Predominant NYHA class
SOLVD Prevention <sup>19</sup>	1998	4,228	4	I-II
SOLVD Treatment <sup>60</sup>	1991	2,569	10	II-III
V-HEFT <sup>61</sup>	1993	1,427	14	II-III
CHF-STAT <sup>267</sup>	1995	674	15	II-III
DIAMOND-MI <sup>268</sup>	2000	1,510	7	II-III
COMET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

Ling LH , et al. *Nature Reviews Cardiology* 2016;13:131-47

Data indicate that prevalence of AF increases according to severity of HF. AF, atrial fibrillation; HF, heart failure. \*Percentages include AF and atrial flutter.

# Atrial Fibrillation & Heart Failure: Epidemiology

Framingham population - 1470 patients - mean follow-up = 5.6 years

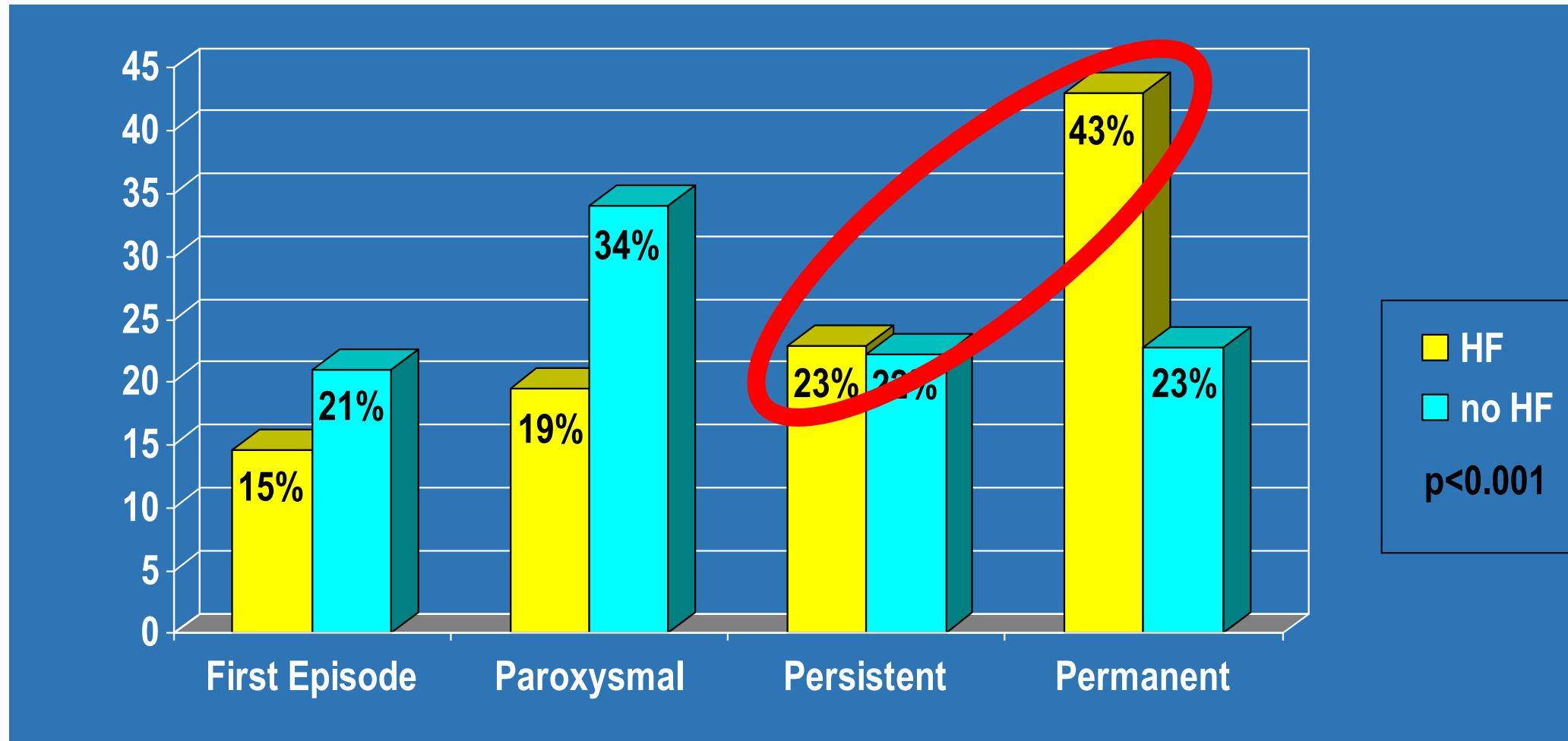


# Atrial Fibrillation & Heart Failure: Prognosis

**TABLE 2. Cox Multivariable Proportional Hazards Models Examining the Impact of the Comorbid Condition on Mortality**

Models	Men, Adjusted HR (95% CI)	Women, Adjusted HR (95% CI)
Comorbid condition as a time-dependent variable		
(A) Mortality after AF		
Impact of incident CHF	→ 2.7 (1.9 to 3.7)*	3.1 (2.2 to 4.2)*
(B) Mortality after CHF		
Impact of incident AF	→ 1.6 (1.2 to 2.1)†	2.7 (2.0 to 3.6)*

# Atrial Fibrillation & Heart Failure: Epidemiology

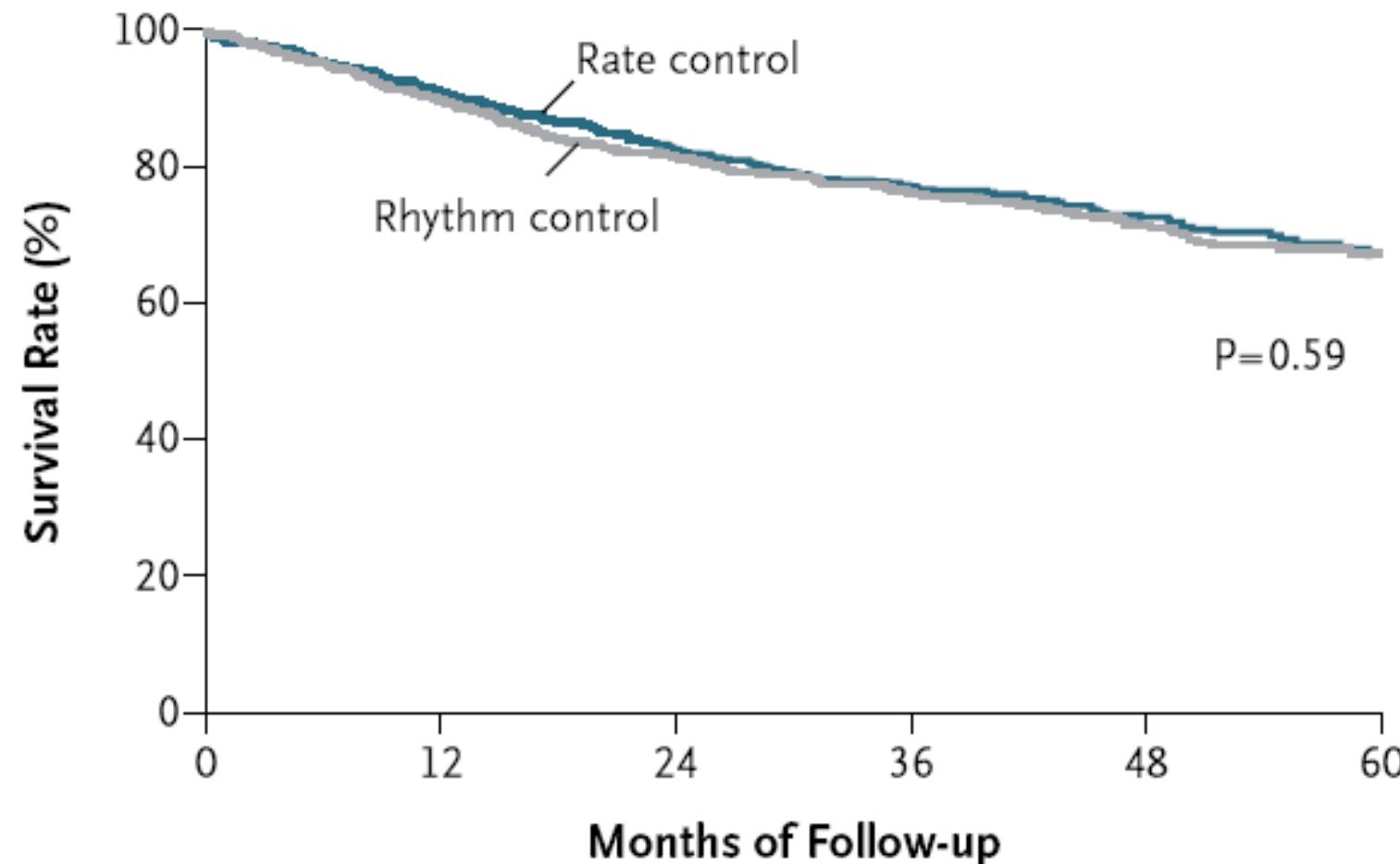


The different types of AF at entry in the registry in relation to the presence of HF

*Rate control or Rhythm control ?*

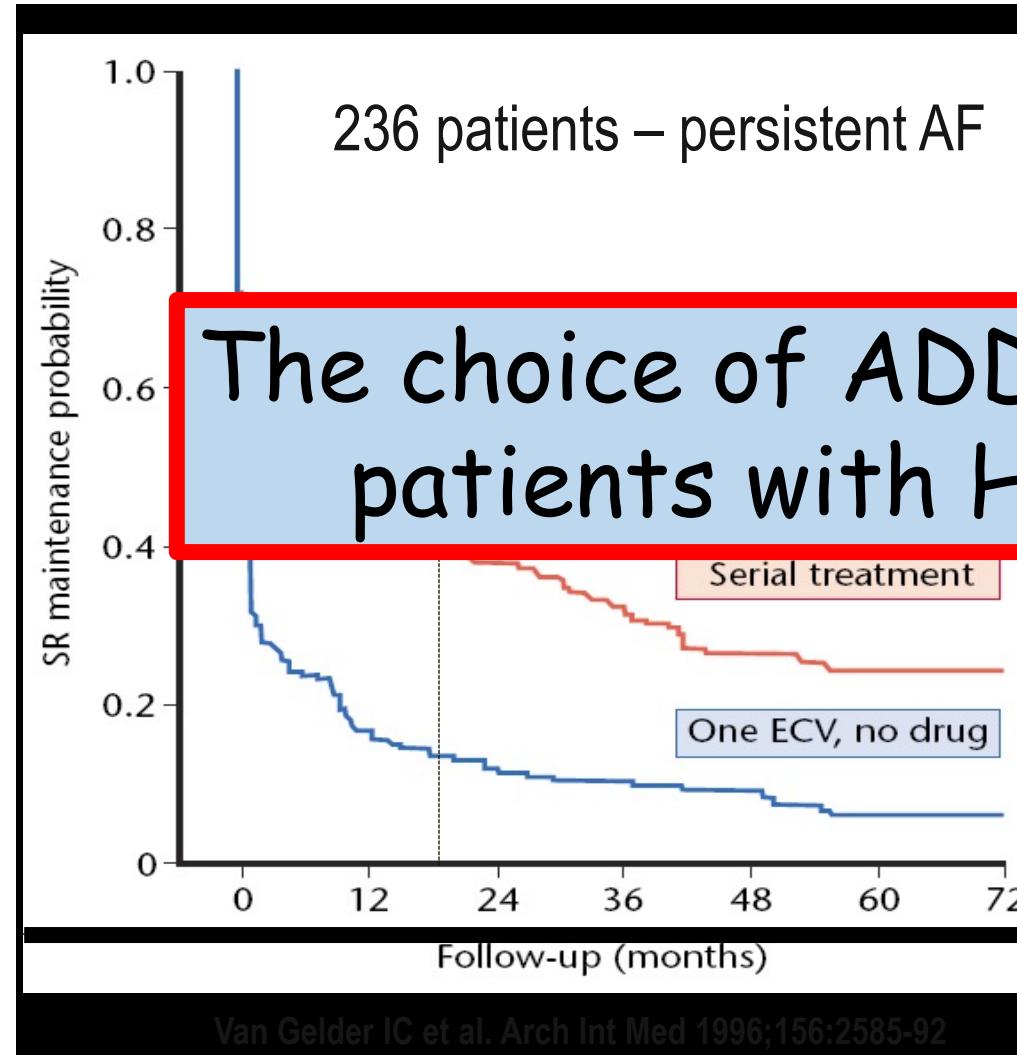
# Rate control vs. Rhythm control

## CHF trial : a dedicated study in patients with HF



*Roy D et al. N Engl J Med 2008;358:2667-77*

# The efficacy of antiarrhythmic drugs is modest to maintain sinus rhythm in patients with persistent AF



The choice of ADDs is very limited in patients with HF: amiodarone !

**Table 2.** Study End Points

	Rhythm-Control (n = 100)	Rate-Control (n = 100)
Follow-up, mean, months (SD)	19.5 (8.9)	19.7 (8.9)
Follow-up, range, months	0–36	1–36
Secondary end points		
Syncope	0	1
Bleeding	11	8
Sinus rhythm at last follow-up†	38	9
Hospitalization for cardiovascular disease†		
Number	54	26
Duration, total, days	449	314

\*p = 0.99; †two were sudden deaths in the rhythm-control group and four were sudden deaths in the rate-control group; ‡p < 0.001.

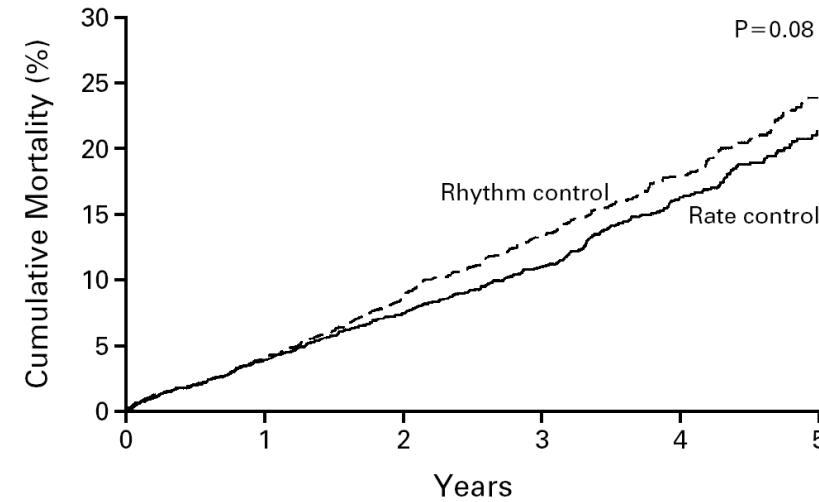
TIA = transient ischemic attack.

# Survival rate in patients with AF: negative impact of AADs vs. benefit of sinus rhythm

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.



*The AFFIRM Investigators N Engl J Med 2002;347:1825-33*

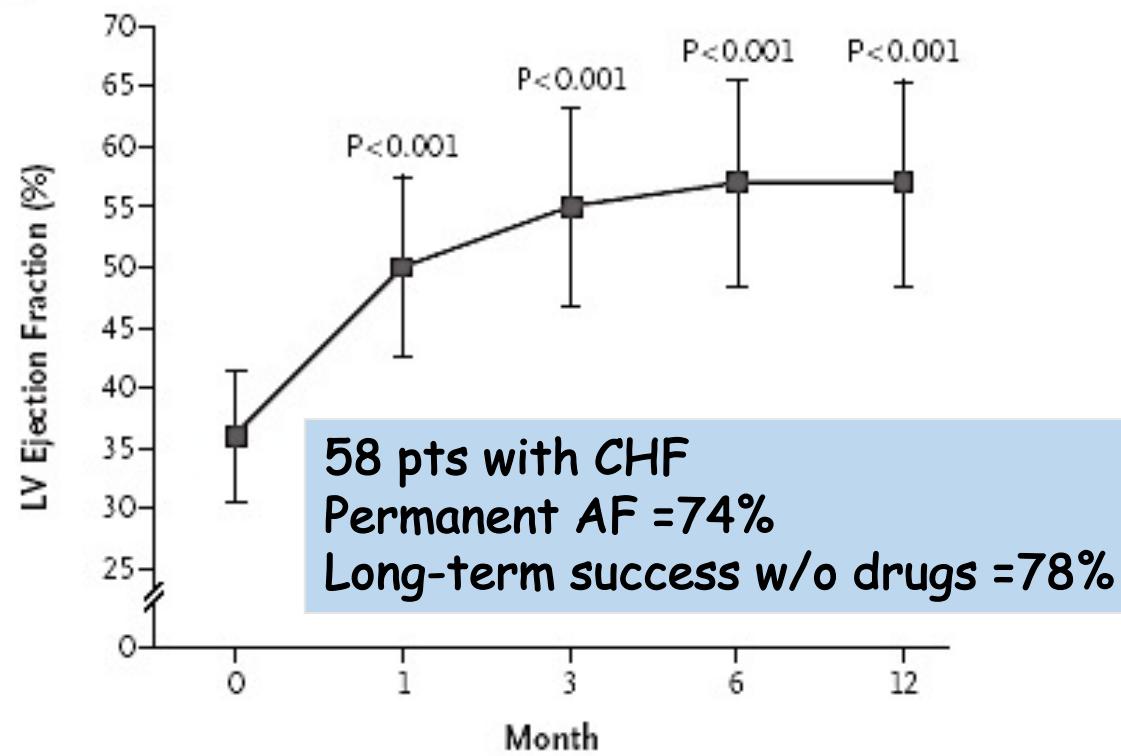
## Implications

In patients with AF such as those enrolled in the AFFIRM Study, warfarin use improves survival. The presence of SR but not AAD use is associated with a lower risk of death. These results suggest that if an effective method for maintaining SR with fewer adverse effects were available, it might improve survival.

*The AFFIRM Investigators Circulation  
2004;109:1509-13*

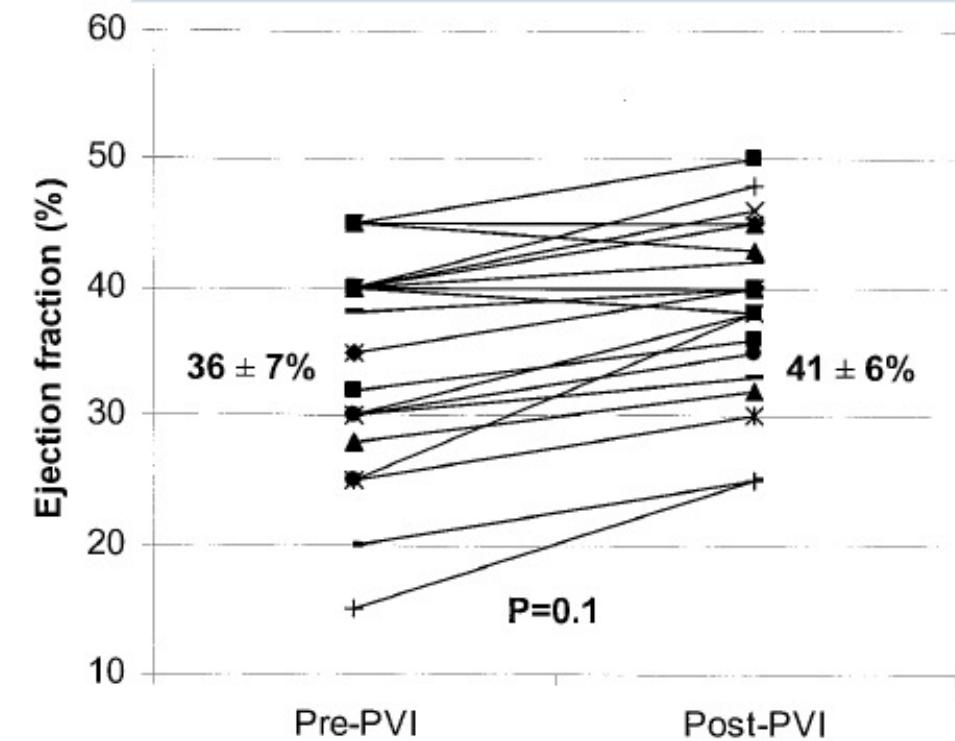
# **AF ablation in patients with HF Data from the literature**

# AF ablation in patients with HF



Hsu LF et al. N Engl J Med 2004;351:2373-83  
University Hospital Bordeaux

94 pts with LV dysfunction  
Persistent / Permanent AF = 61%  
Long-term success w/o drugs = 73%



Chen MS et al. J Am Coll Cardiol 2004;43:1004-9  
Cleveland Clinic, Cleveland, Ohio

# Catheter Ablation for AF in HF patients: A meta-analysis of randomized controlled trials Ablation vs rate control

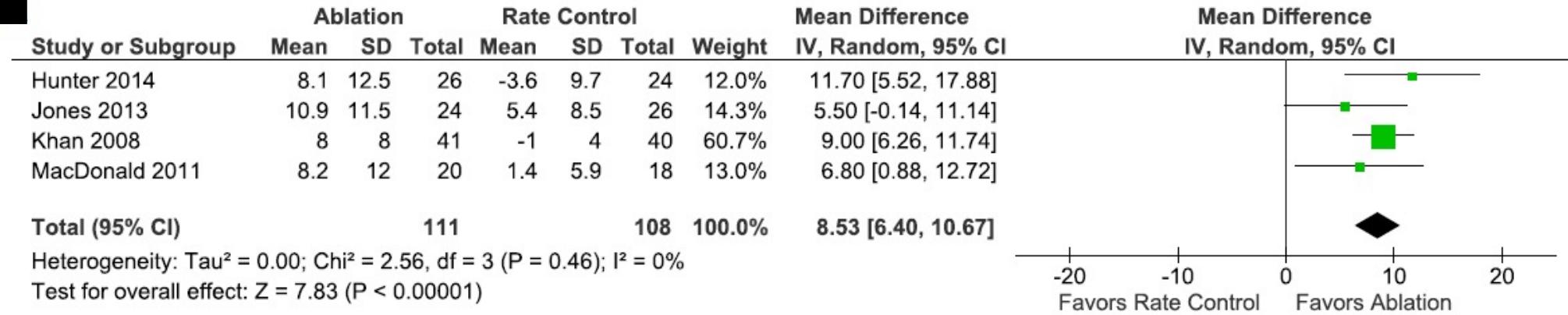
<b>TABLE 2 Intervention Characteristic</b>	<b>2008</b>	<b>2011</b>	<b>2013</b>	<b>2014</b>
	Khan et al. (22)	Jones et al. (24)	Macdonald et al. (23)	Hunter et al. (25)
Blanking period, months	2	2	3	3
Frequency of monitoring, months	2, 3*, 6	2, 3, 6, 12	3*, 6	1, 3, 6
Modality of assessing heart rhythm	Loop recorder	48-h Holter monitor Existing implanted devices	24-h Holter monitor	48-h Holter monitor
AAD strategy after ablation	AAD for 2 months	AAD stopped after ablation	Amiodarone for 3 months	AAD stopped after ablation
No. of patients undergoing repeat procedures, n (%)	8 (19.5)	5 (20.1)	6 (30.0)	14 (53.7)
Cross-over	None	2†	None	None
Ablation strategy of AF	PVI ± Linear lesions and sources of complex fractionated electrograms	PVI ± Linear lesions ± left atrial complex fractionated electrograms ± Cardioversion and cavotricuspid isthmus ablation	PVI ± Linear lesions and sources of complex fractionated electrograms ± Cardioversion ± cavotricuspid isthmus ablation	PVI with ablation of complex or fractionated electrograms ± Linear lesions ± Cavotricuspid isthmus ablation
Follow-up, months	6	12	6	6-12

\*Only in the atrial fibrillation (AF) catheter ablation group. †One patient in the AF catheter ablation group and one patient in the rate-control group. Intention-to-treat analysis was used.

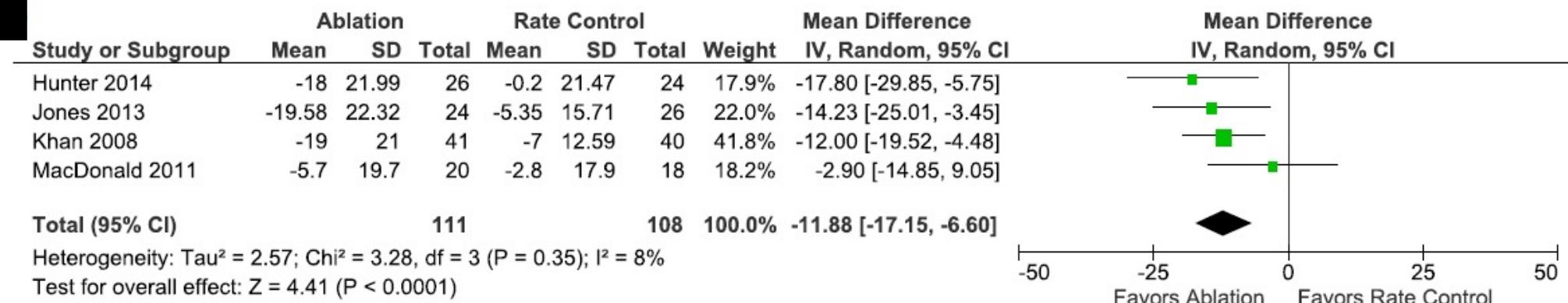
AAD = antiarrhythmic drug; PVI = pulmonary vein isolation.

# Catheter Ablation for AF in HF patients: A meta-analysis of randomized controlled trials Ablation vs rate control

## Change in LVEF

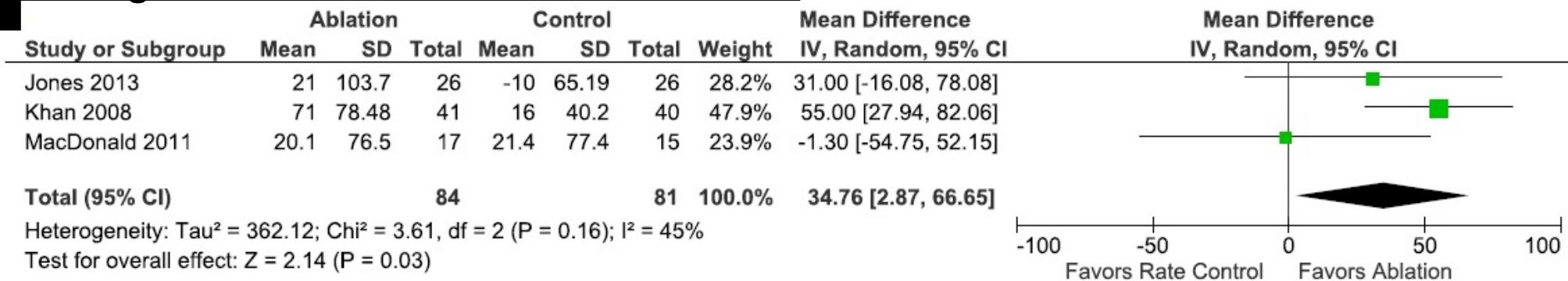


## Change in Minnesota Living With Heart Failure

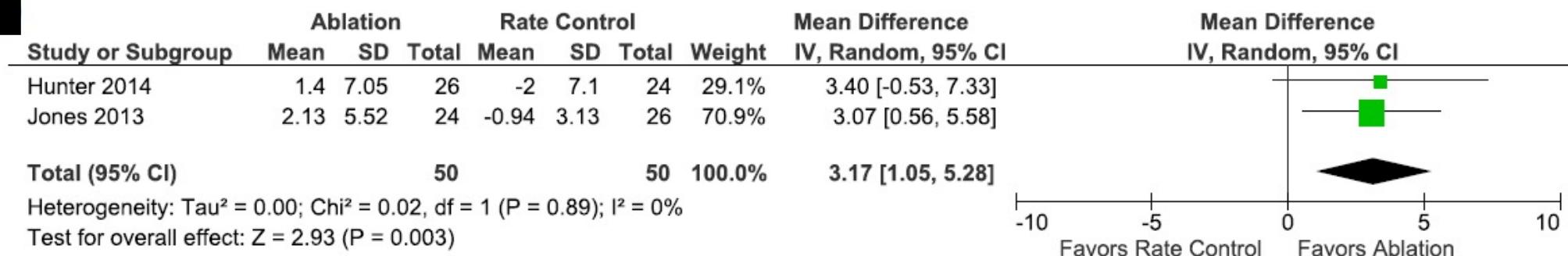


# Catheter Ablation for AF in HF patients: A meta-analysis of randomized controlled trials Ablation vs rate control

## Change in 6-minute walk test distance



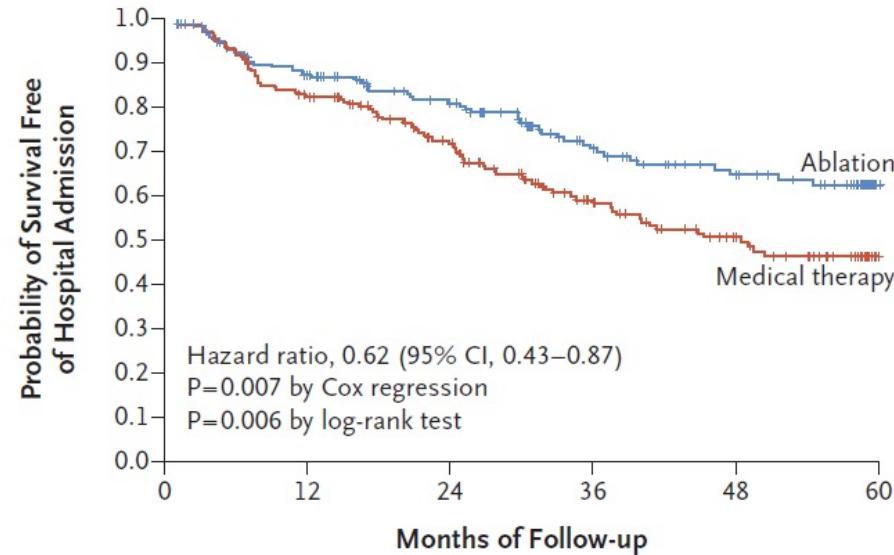
## Change in peak oxygen consumption ( $\text{VO}_2$ )



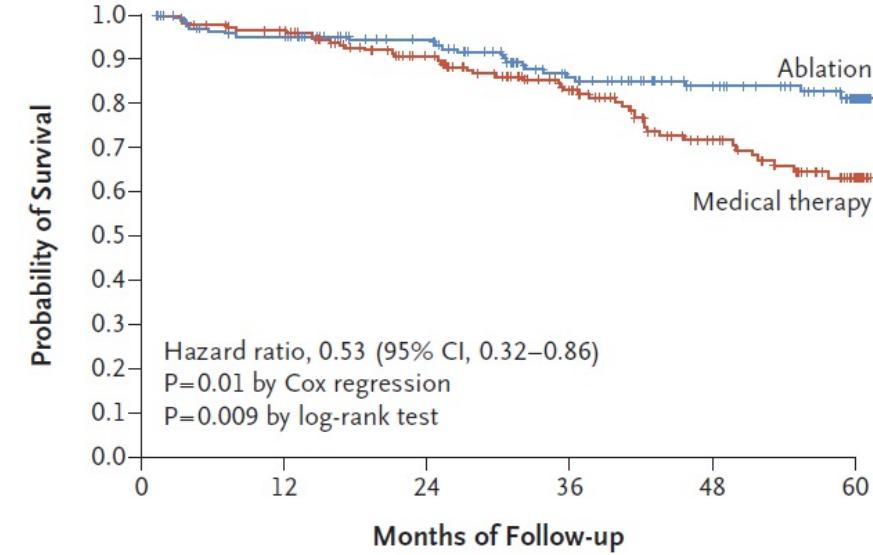
# CASTLE-AF

## Catheter Ablation versus Standard Conventional Treatment in Patients with Left Ventricular Dysfunction and Atrial Fibrillation

A Death or Hospitalization for Worsening Heart Failure



B Death from Any Cause



No. at Risk

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

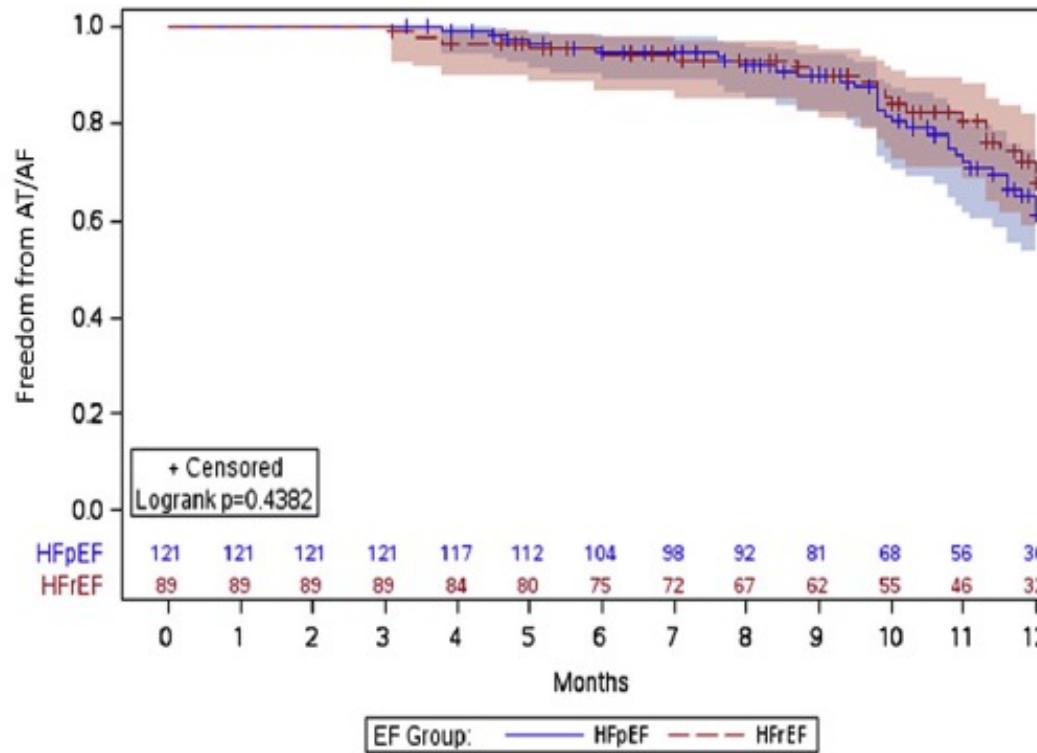
No. at Risk

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

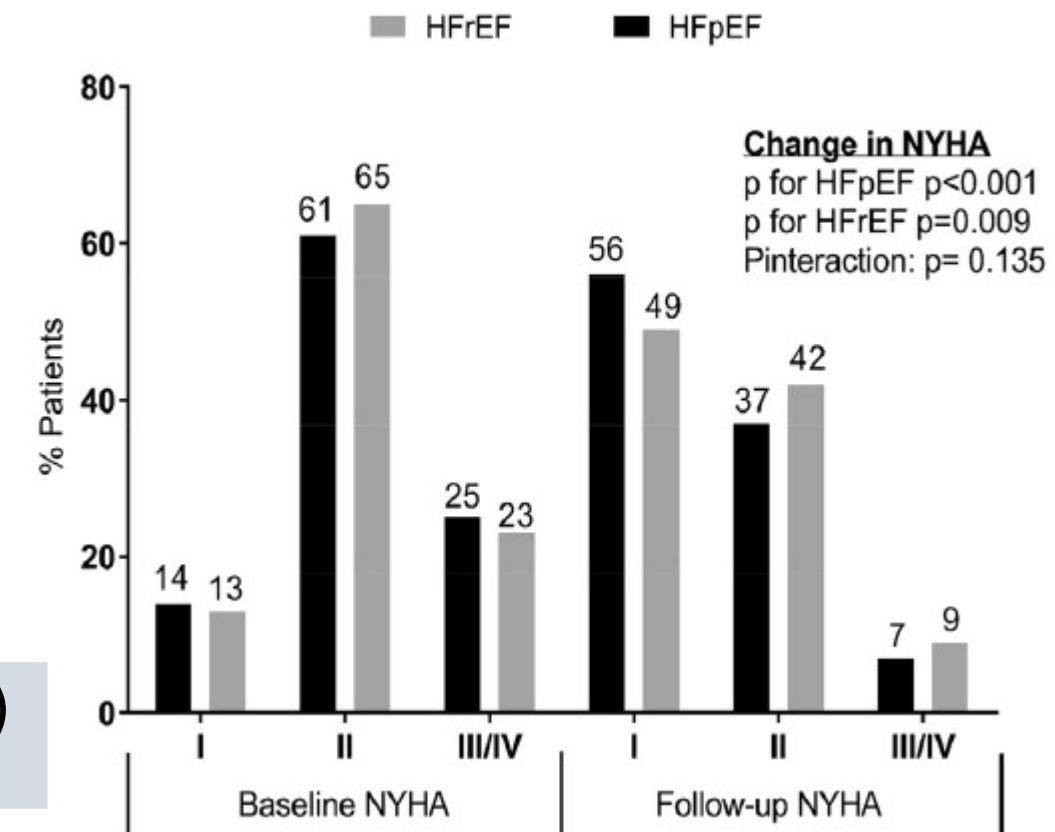
Persistent AF = 67% (duration >1 year = 29%) – Median LVEF = 32% – Median LA diameter = 49mm

Marrouche NF et al. N Eng J Med 2018;378:417-27

# Catheter Ablation of Atrial Fibrillation in Patients with Heart Failure and Preserved Ejection Fraction

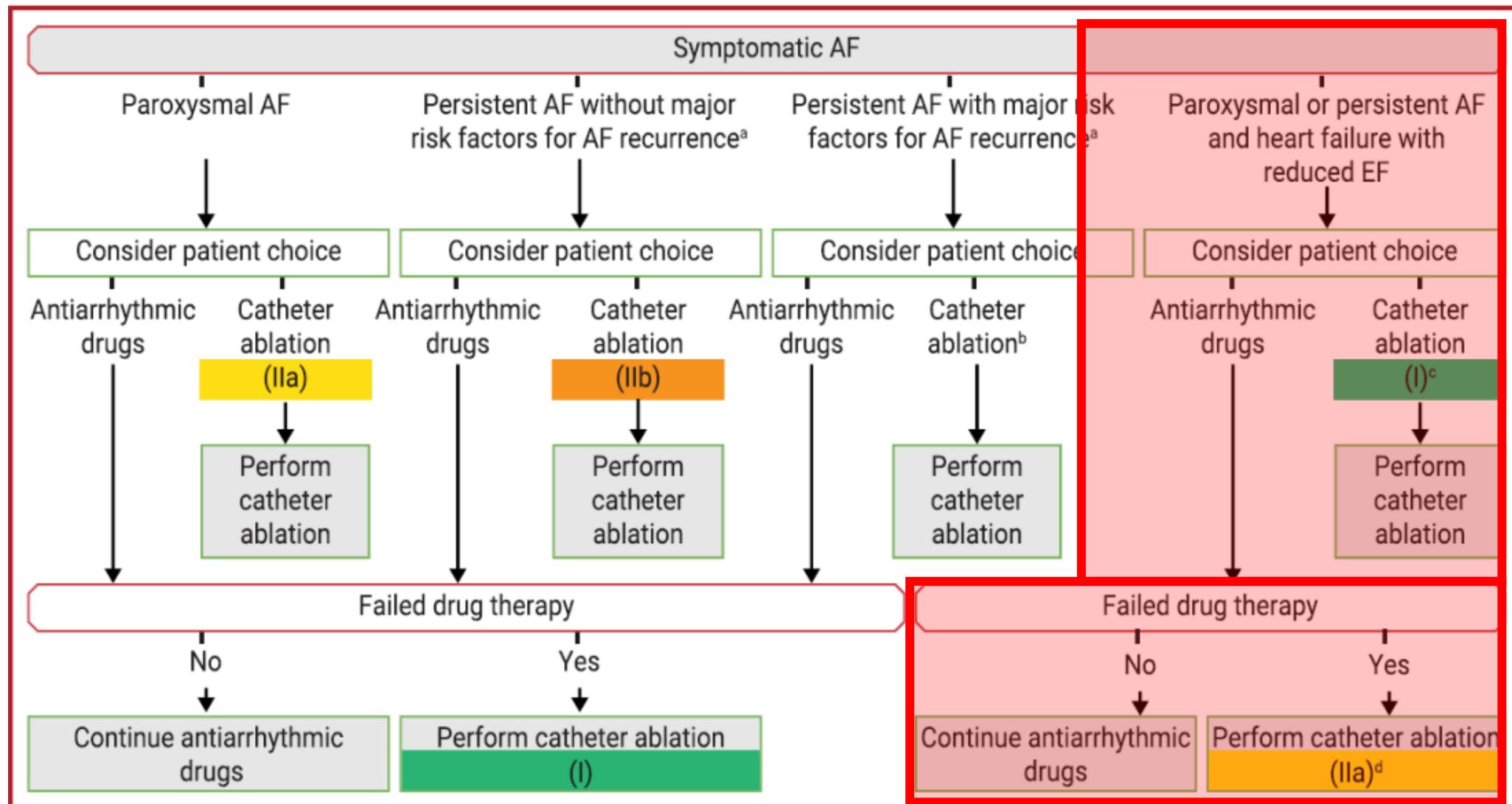


230 patients with HFrEF (42%) or HFpEF (58%)  
Persistent AF = 63%



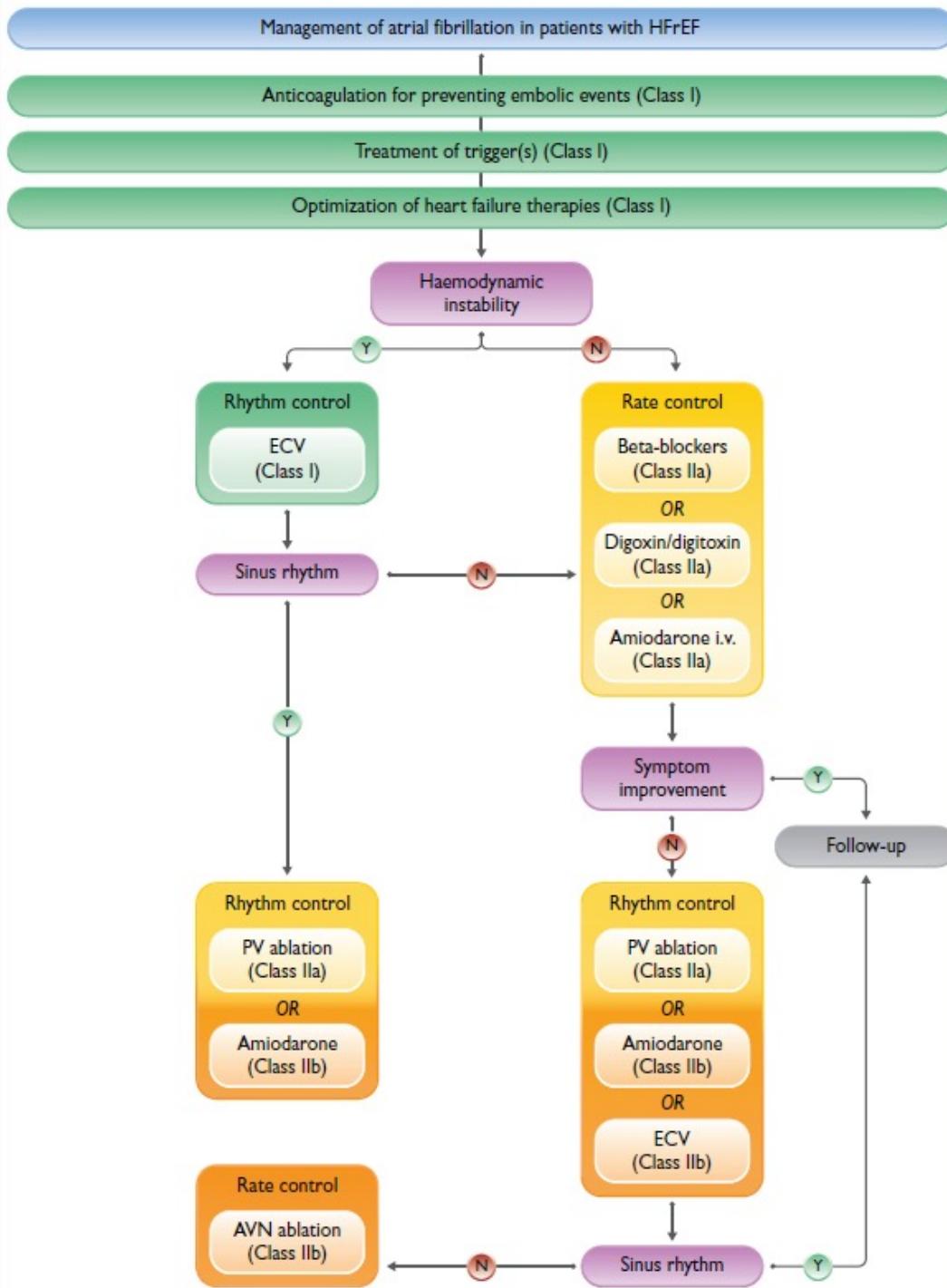
# **Management of AF in patients with HF**

# 2021 ESC Guidelines



# ESC 2021

- Arbre décisionnel



# CAT selon le tableau clinique

- Patient IC connu déstabilisé à l'occasion d'un passage en FA
  - Evaluation anatomique: valvulopathie (IM), taille de l'OG, FEVG...
  - Comorbidité: SAS, obésité, insuf. Rénale ...
  - Ancienneté de la FA, relation temporelle avec la décompensation, cadence ventriculaire en FA

**Cardioversion électrique rapide (possible dans tous les cas)**

**Probabilité non nulle de restaurer le RS sur le « long » terme: Ablation**

**Alternatives: Ablation du NAV et stimulation physiologique / CRT**

- Patient avec FA, développant des signes IC / altération FEVG
  - FA récente: cardiomyopathie rythmique : **Ablation +++**
  - FA ancienne: cf situation précédente

# Conclusions

- ❑ IC et FA : c'est grave et de prise en charge difficile
- ❑ Pas de bénéfice de mortalité du contrôle du rythme *pharmacologique* / contrôle de la fréquence
- ❑ Chez des patients sélectionnés, l'ablation améliore les symptômes, les capacités fonctionnelles et la FEVG
- ❑ Une étude RC montre une supériorité de l'ablation par rapport au tt médicamenteux (critère combiné de mortalité et hospitalisation pour IC)
- ❑ Ne pas oublier la prise en charge habituelle de l'insuffisance cardiaque