



**38<sup>ème</sup>** CONGRÈS NATIONAL  
DE CARDIOLOGIE  
ET DE CHIRURGIE  
CARDIO-VASCULAIRE  
Joint au  
**2<sup>ème</sup>** CONGRÈS  
DES SOCIÉTÉS AFRICAINES  
DE CARDIOLOGIE



Séance commune  
STCCCV/SFC

# **Fibrillation auriculaire et insuffisance cardiaque: réduire ou ralentir?**

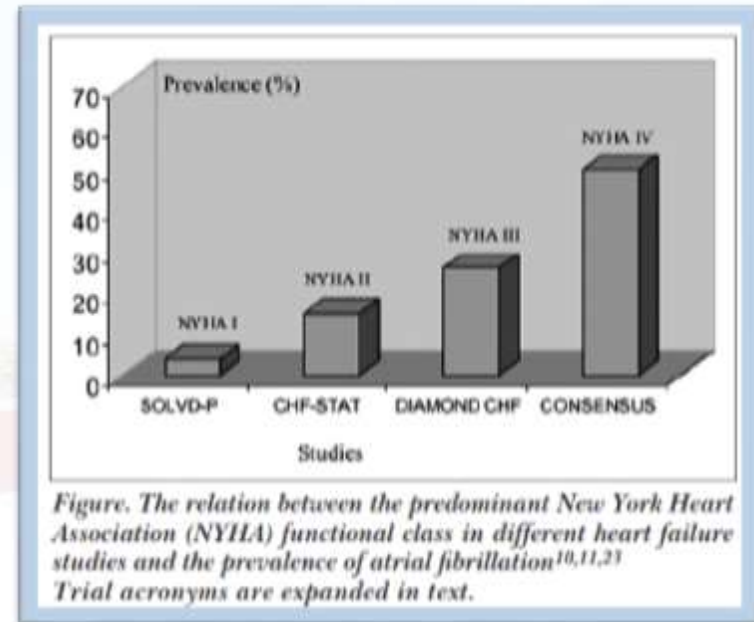
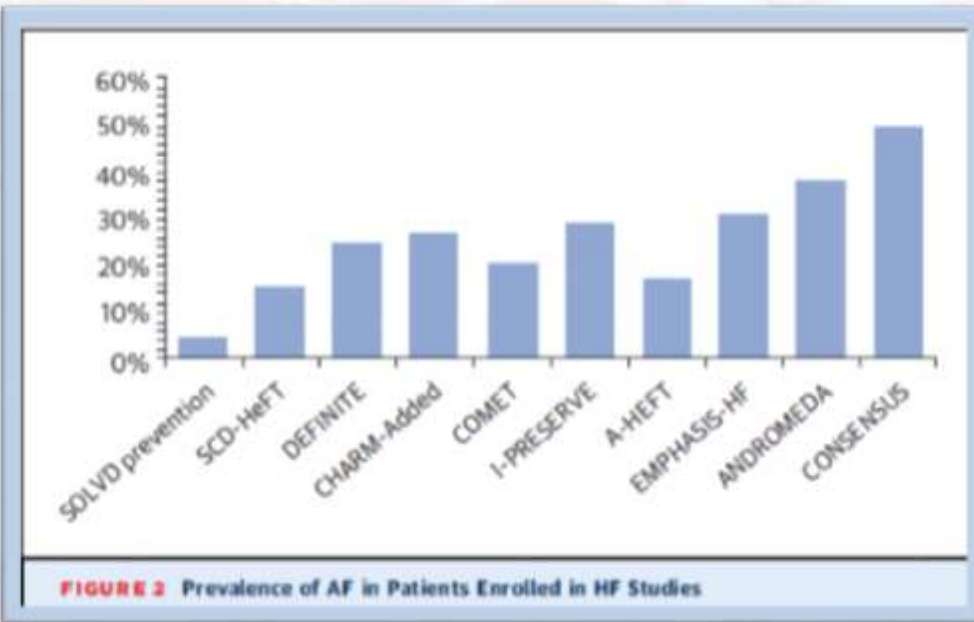
Pr Ag MARRAKCHI Sonia  
Hôpital Abderrahmane Mami  
Tunis, Tunisie

# Déclaration de conflits d'intérêts

**Aucun conflit d'intérêt**

# Introduction

- FA → Prévalence d'IC de 50 %
- IC → Prévalence de FA 15-50%.

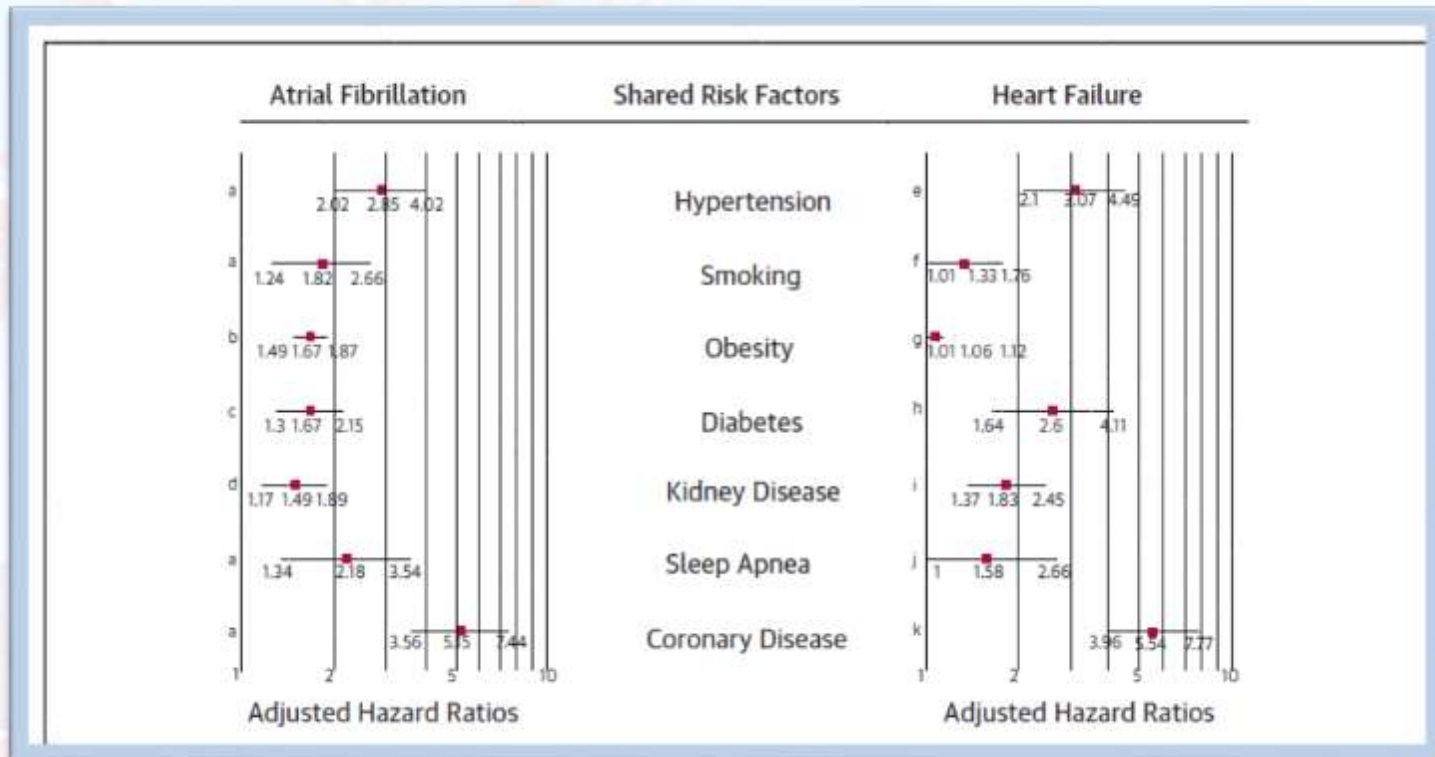


# Rhythm Control in Heart Failure Patients With Atrial Fibrillation



Contemporary Challenges Including the Role of Ablation

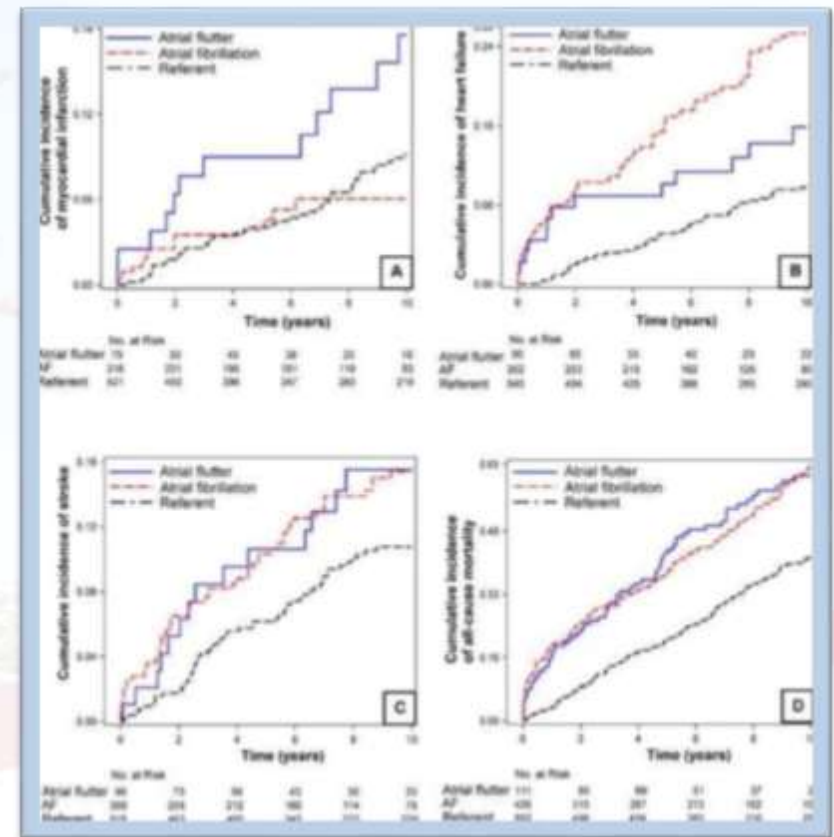
Kevin M. Trulock, MD,\* Sanjay M. Narayan, MD, PhD,† Jonathan P. Piccini, MD, MHS\*



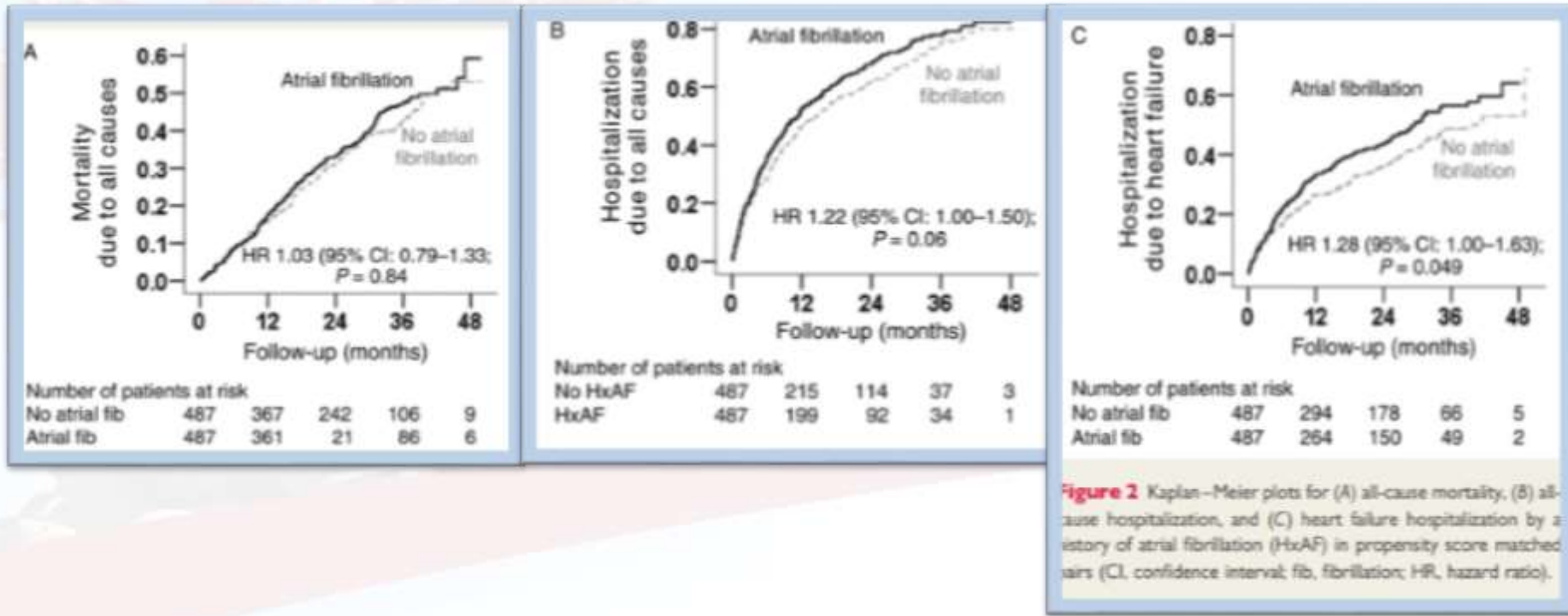
Les comorbidités représentent des facteurs de risques indépendant aussi bien pour la FA que IC.

- FA chez les IC :

- Réduction de la qualité de vie
- Progression de l'IC, Aggrave la dysfonction VG
- Augmentation du risque d'AVC, d'embolie systémique
- Augmentation du risque de décharge de DAI

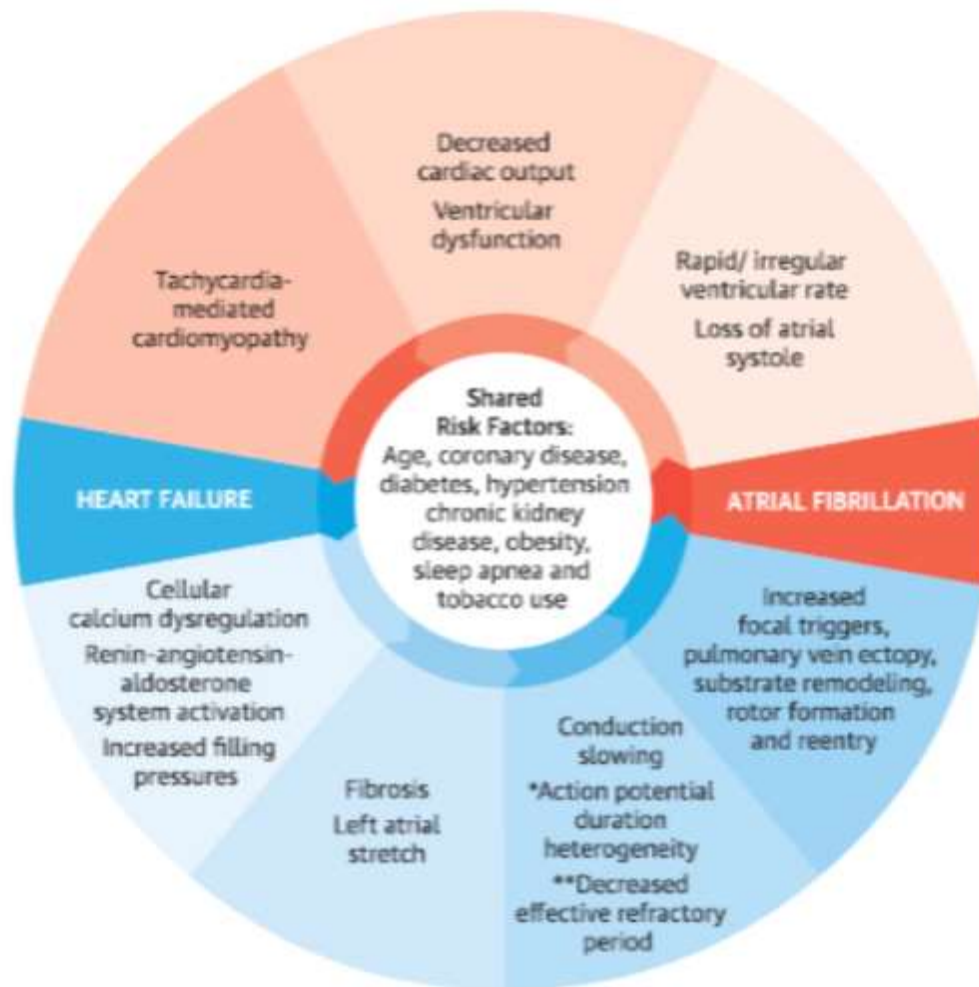


# Pronostic



# Physiopathologie





**CENTRAL ILLUSTRATION** The Physiological Relationship Between Atrial Fibrillation and Heart Failure

\*Action potential duration heterogeneity includes spatial and temporal nonuniformities (36). \*\*This mechanistic hypothesis has fallen out of favor with recent evidence (33).



# RÉDUIRE ou RALENTIR la FA chez les patients en IC



# Rate versus rhythm control in atrial fibrillation and clinical outcomes: Updated systematic review and meta-analysis of randomized controlled trials

Contrôle de la fréquence ou du rythme cardiaque dans la fibrillation atriale :  
méta-analyse des études randomisées contrôlées

Daniel Caldeira<sup>a</sup>, Cláudio David<sup>a,\*,b</sup>,  
Cristina Sampaio<sup>a,c</sup>

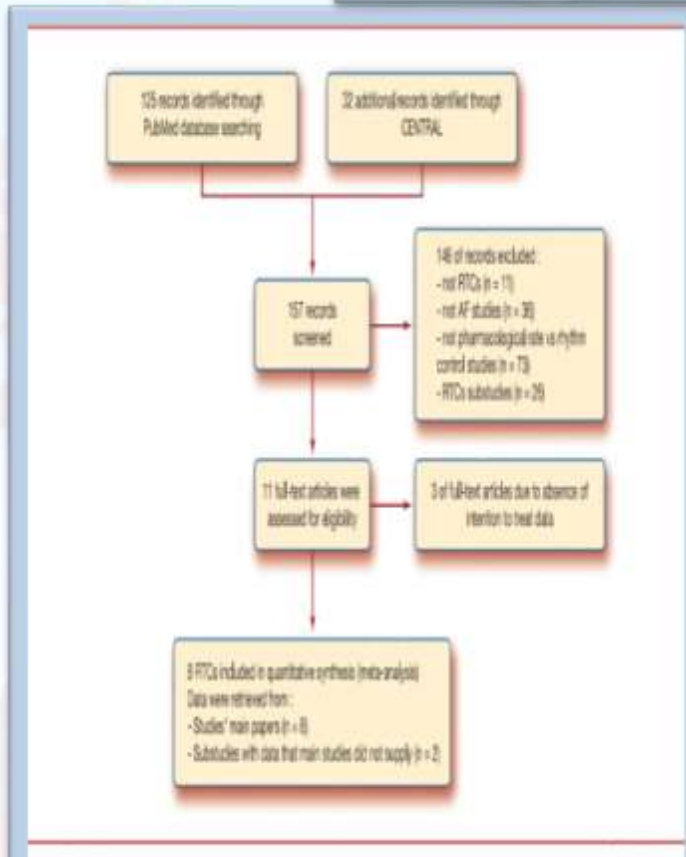


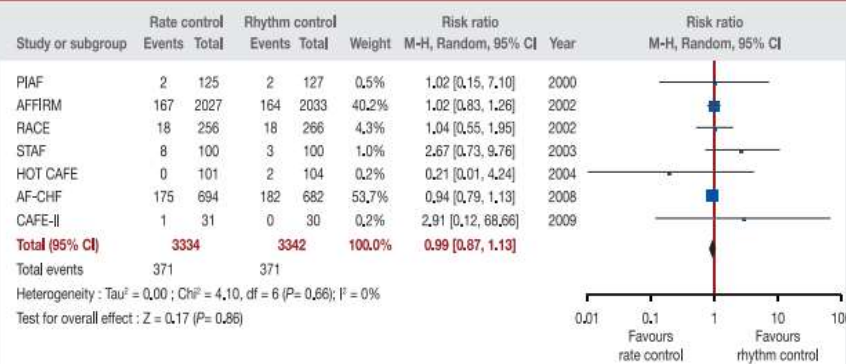
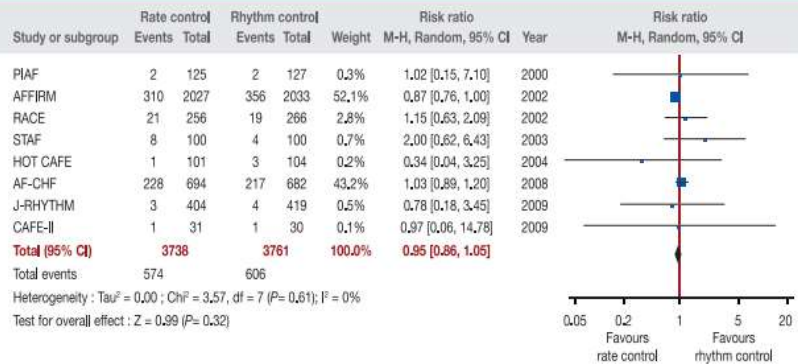
Table 2 Data and results from individual studies.

| Study    | Population                                                                                                | Rate control (n) | Rhythm control (n) | Primary outcome                                                                                                                                                          | Conclusions                                                                                                                                                                               |
|----------|-----------------------------------------------------------------------------------------------------------|------------------|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| FAF      | New-onset AF present for $\geq 7$ days and $< 1$ year                                                     | 115              | 127                | Improvement in AF-related symptoms (palpitations and frequency of dyspnea or dizziness)                                                                                  | No differences in primary outcome and quality of life; rhythm control better in exercise tolerance                                                                                        |
| RACE     | Recurrent persistent AF or flutter for $> 1$ year                                                         | 256              | 266                | Composite of cardiovascular death, heart failure, embolism, bleeding, pacemaker implantation and severe adverse effects of drugs                                         | No statistically significant differences in primary outcome; rate superior to rhythm control in women and hypertensive subgroups                                                          |
| ATTRA    | Likely to be recurrent AF in pts aged $> 65$ years with risk factors for stroke or death                  | 2027             | 2033               | All-cause mortality                                                                                                                                                      | No differences in primary outcome; rate control prevented mortality in age $> 65$ years, coronary artery disease and no AF group(7); rate control also better at reducing hospitalization |
| ESAF     | Recurrent and persistent AF present for $> 4$ weeks and $< 2$ years with $\geq 1$ previous cardiovascular | 100              | 100                | Composite of all-cause mortality, cerebrovascular events, embolism and cardiopulmonary resuscitation                                                                     | No primary outcome advantage with rate vs rhythm control; quality of life improved in two topics with rhythm control and five topics with rate control                                    |
| HOA-CAFÉ | AF present for $\geq 7$ days and $< 2$ years                                                              | 101              | 104                | Composite of all-cause mortality and thromboembolic and major bleeding                                                                                                   | No significant differences in primary outcome; hospitalization lower in rate control                                                                                                      |
| AF-CHF   | CHF $\geq 30\%$ , symptoms of CHF and history of paroxysmal or persistent AF for $> 1$ year               | 494              | 482                | Cardiovascular death                                                                                                                                                     | Primary outcome similar with both interventions; hospitalizations more frequent in rhythm control                                                                                         |
| CAFFEIN  | Persistent AF for $> 1$ year                                                                              | 406              | 413                | Composite of total mortality, symptoms, cerebral infarction, systemic embolism, major bleeding, hospitalization for heart failure and physical/psychological disturbance | Rhythm control reduced the frequency in the primary outcome and improved the frequency of symptoms score                                                                                  |
| CAFÉ-II  | Persistent AF with CHA <sub>2</sub> DS <sub>2</sub> -BP and LVEF $\geq 0$                                 | 30               | 30                 | QoL SF-36v2 at 1 year                                                                                                                                                    | Rhythm control improved the primary outcome                                                                                                                                               |

8 études randomisés (7499 patients) ont comparé le contrôle du rythme versus contrôle de la FC.

## Pas de supériorité du contrôle de rythme sur mortalité toutes confondues

## Pas supériorité du contrôle de rythme sur la mortalité cardiovasculaire



## Pas de supériorité du contrôle de rythme sur la mort subite



## Electrophysiology

# Rate control versus rhythm control for patients with persistent atrial fibrillation with mild to moderate heart failure: Results from the RATE Control versus Electrical cardioversion (RACE) study

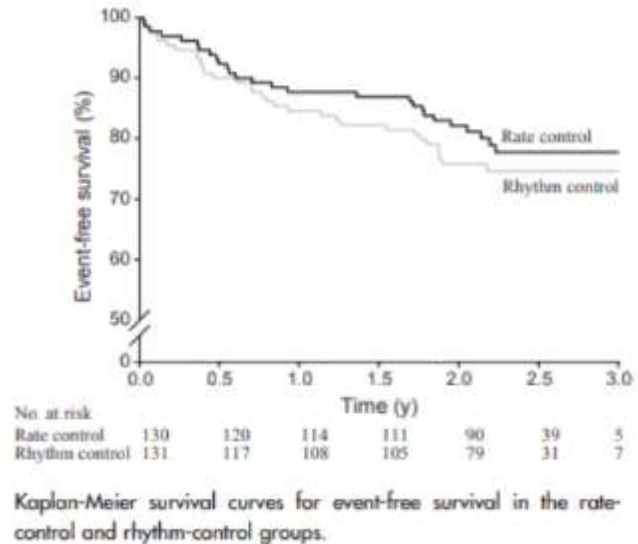
- 261 patients
- FA persistante+ IC NYHA II/III

**Table II.** Incidence of the primary end point and its components according to the treatment group

|                                         | Rate control<br>(n = 130) | Rhythm control<br>(n = 131) |
|-----------------------------------------|---------------------------|-----------------------------|
| Primary end point                       | 22.3 (29)                 | 24.4 (32)                   |
| Cardiovascular mortality                | 11.5 (15)                 | 6.1 (8)                     |
| Sudden death                            | 4.6 (6)                   | 3.1 (4)                     |
| Progression of heart failure            | 2.3 (3)                   | —                           |
| Thromboembolic complications            | —                         | 1.5 (2)                     |
| Bleeding                                | 4.6 (6)                   | 1.5 (2)                     |
| Hospitalization for heart failure       | 5.4 (7)                   | 3.8 (5)                     |
| Thromboembolic complications            | 6.2 (8)                   | 8.4 (11)                    |
| Bleeding                                | 8.5 (11)                  | 3.1 (4)                     |
| Adverse effects of antiarrhythmic drugs | 0.8 (1)                   | 5.3 (7)                     |
| Pacemaker implants                      | —                         | 4.6 (6)                     |

No double counts within lines; between lines double counts are possible. Data are presented as % (n).

**Figure 1**



Le contrôle de la FC n'était pas inférieur au contrôle de rythme.  
la mortalité CV, le saignement, le nombre d'hospitalisation pour IC est moindre dans le groupe de contrôle du rythme.



# Comparison of Rate Versus Rhythm Control for Atrial Fibrillation in Patients With Left Ventricular Dysfunction (from the AFFIRM Study)

Ronald S. Freudenberger, MD\*, Alan C. Wilson, PhD, and John B. Kostis, MD, for the AFFIRM Investigators and Committees

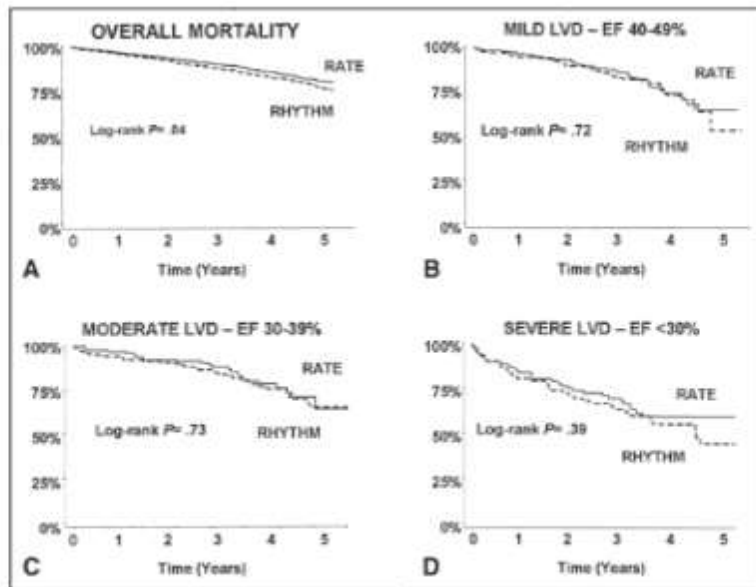


Figure 1. Kaplan-Meier survival rates in the rhythm control group (dashed line) and the rate control group (solid line) of AFFIRM trial subjects with measured LVEF: overall population (A), EF of 40% to 49% (B), EF of 30% to 39% (C), and EF of <30% (D). LVD = LV dysfunction.

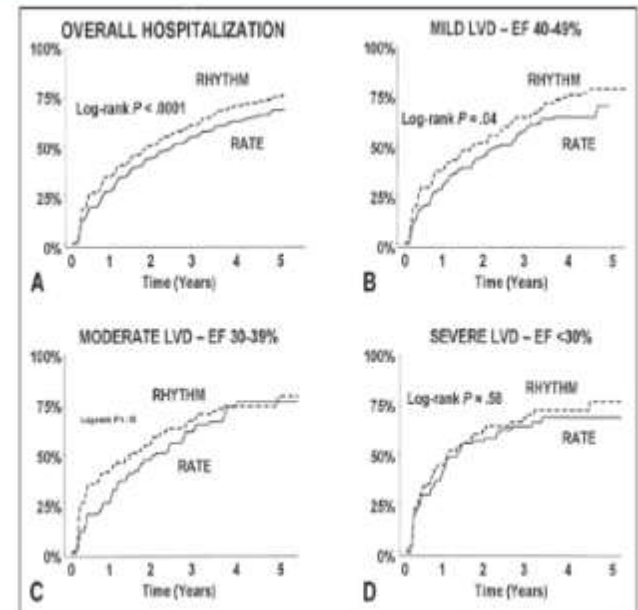


Figure 2. Cumulative hospitalization in the rhythm control group (dashed line) and the rate control group (solid line) of AFFIRM trial subjects with measured LVEF: overall population (A), EF of 40% to 49% (B), EF of 30% to 39% (C), and EF of <30% (D). LVD = LV dysfunction.

Pas de réduction de mortalité CV ni d'hospitalisation entre les deux groupes

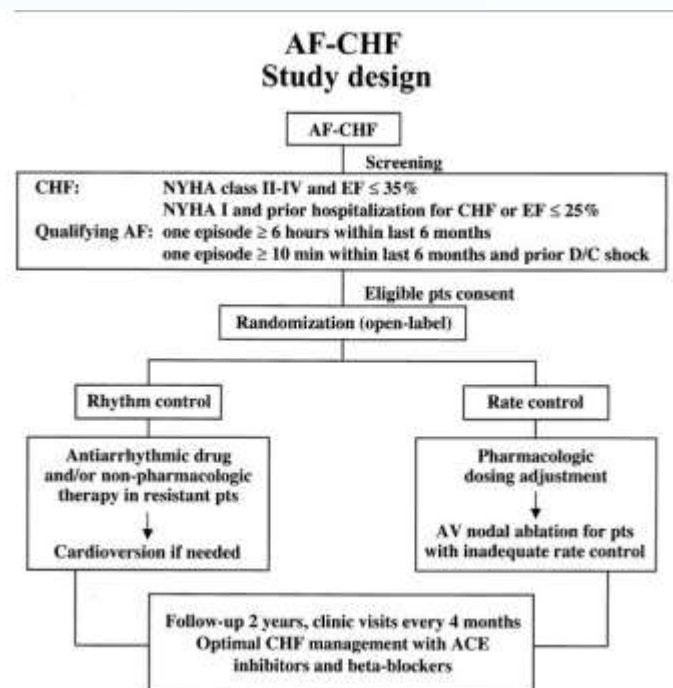
Le contrôle du RS a échoué à améliorer la qualité de vie.



# Quality of Life and Functional Capacity in Patients With Atrial Fibrillation and Congestive Heart Failure

Irina Suman-Horduna, MD, MSc,\* Denis Roy, MD,\* Nancy Frasure-Smith, PhD,\*†  
Mario Talajic, MD,\* François Lespérance, MD,† Lucie Blondeau, MSc,\* Paul Dorian, MD, MSc,‡  
Paul Khairy, MD, PhD,\* on behalf of the AF-CHF Trial Investigators

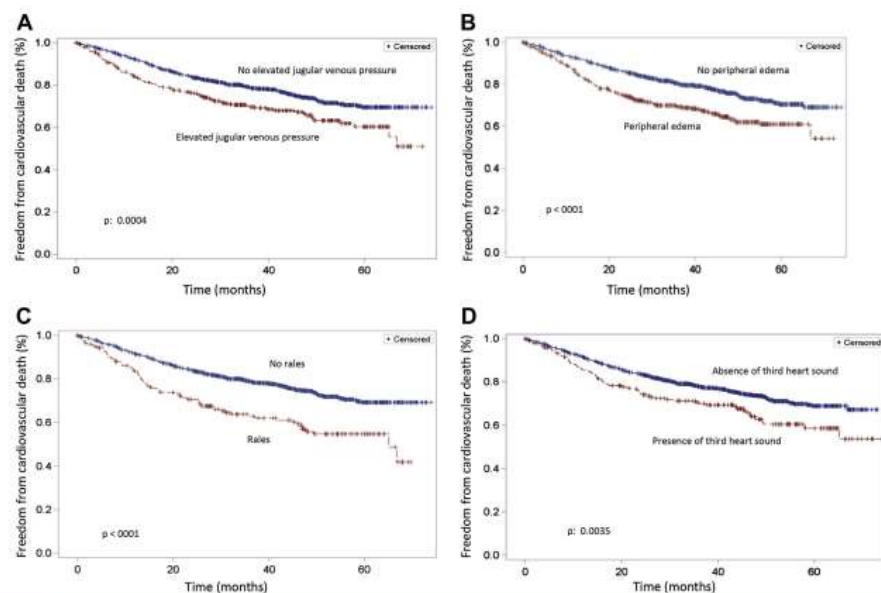
- Étude randomisée
- 1376 patients présentant:
  - ATCD de FA (33% paroxystique, 67% persistante)
  - associé à une IC symptomatique de (NYHA II-IV) avec dysfonction VG FEVG < 35%.



MINI FOCUS ISSUE: PHYSICAL EXAM

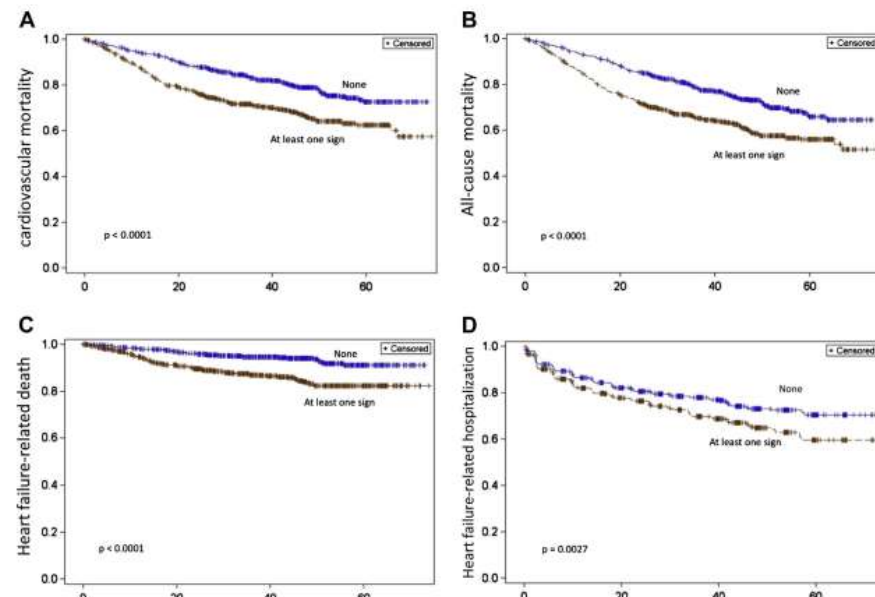
# Prognostic Value of the Physical Examination in Patients With Heart Failure and Atrial Fibrillation

Insights From the AF-CHF Trial  
(Atrial Fibrillation and Chronic Heart Failure)



**Figure 1** Kaplan-Meier Estimates of Death From Cardiovascular Causes (Primary Outcome)

Kaplan-Meier analysis of event-free survival for the primary endpoint (cardiovascular mortality) according to the presence (red) or absence (blue) of elevated jugular venous pressure (A), peripheral edema (B), rales (C), and third heart sound (D). Comparisons were performed by log-rank tests.



**Figure 2** Kaplan-Meier Estimates of Secondary Outcomes, in Patients With at Least 1 Positive Congestive Sign on Physical Examination Versus None

Freedom from cardiovascular mortality (A), all-cause mortality (B), heart failure-related death (C), and heart failure-related hospitalization (D) are plotted in patients with at least 1 positive congestive sign on the physical examination (red) versus none (blue). Comparisons were performed by log-rank tests.

Une amélioration de la QOF pour les deux groupes mais le RS a montré une légère supériorité dans QOL et NYHA.



# Does Conversion and Prevention of Atrial Fibrillation Enhance Survival in Patients with Left Ventricular Dysfunction? Evidence from the Danish Investigations of Arrhythmia and Mortality ON Dofetilide/ (DIAMOND) Study

La stratégie du maintien du RS par Dofetilide chez les patients insuffisants cardiaque en FA versus ralentir la FA

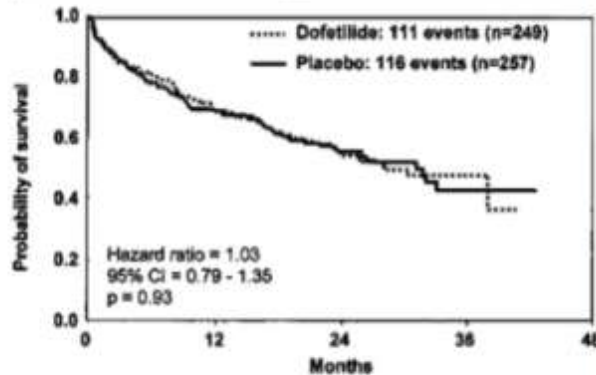
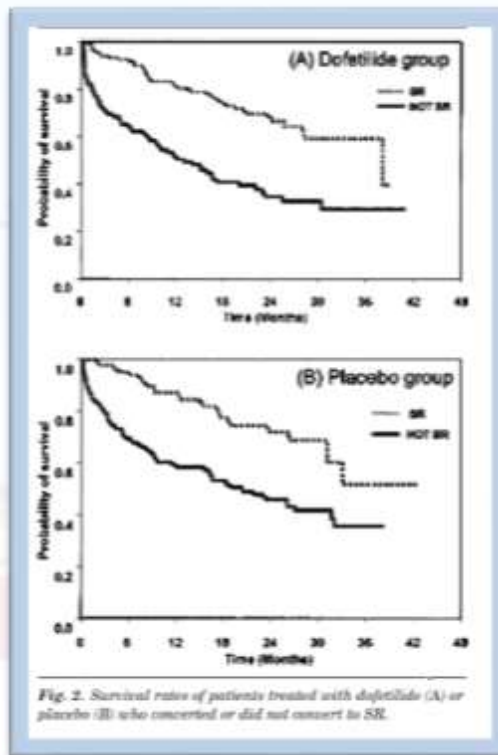


Fig. 1. Survival rates of 506 patients with left ventricular dysfunction and atrial fibrillation /-flutter treated with dofetilide (n = 249) or placebo (n = 257).



baisse de la mortalité de chez les patients présentant RS

# Études contradictoires sur le bénéfice du maintien du rythme sinusal chez les patients en FA+IC



1. Un biais de recrutement
2. Augmentation de la mortalité avec les AAR class Ic et dronedarone.
3. Les AAR sont limités dans cette population: amiodarone et dofetilide
4. Effets toxiques des Antiarythmiques cardiaques et non cardiaques : effet proarythmique, trouble de conduction, effet inotrope négative, des effets extracardiaques
5. Le taux de récurrence est de 50% ou plus à un an chez les patients en FA et IC

=>L'effet bénéfique du maintien du rythme sinusal est neutralisé par les effets délétères dues aux effets indésirables des AAR

ORIGINAL ARTICLE

## Pulmonary-Vein Isolation for Atrial Fibrillation in Patients with Heart Failure

Mohammed N. Khan, M.D., Pierre Jaïs, M.D., Jennifer Cummings, M.D., Luigi Di Biase, M.D., Prashanthan Sanders, M.D., David O. Martin, M.D., Josef Kautzner, M.D., Steven Hao, M.D., Sakis Themistoclakis, M.D., Raffaele Fanelli, M.D., Domenico Potenza, M.D., Raimondo Massaro, M.D., Oussama Wazni, M.D., Robert Schweikert, M.D., Walid Saliba, M.D., Paul Wang, M.D., Amin Al-Ahmad, M.D., Salwa Beheiry, M.D., Pietro Santarelli, M.D., Randall C. Starling, M.D., Antonio Dello Russo, M.D., Gemma Pelargonio, M.D., Johannes Brachmann, M.D., Volker Schibgilla, M.D., Aldo Bonso, M.D., Michela Casella, M.D., Antonio Raviele, M.D., Michel Haissaguerre, M.D., and Andrea Natale, M.D., for the PABA-CHF Investigators

Objectif: comparer contrôle du rythme versus contrôle de la FC

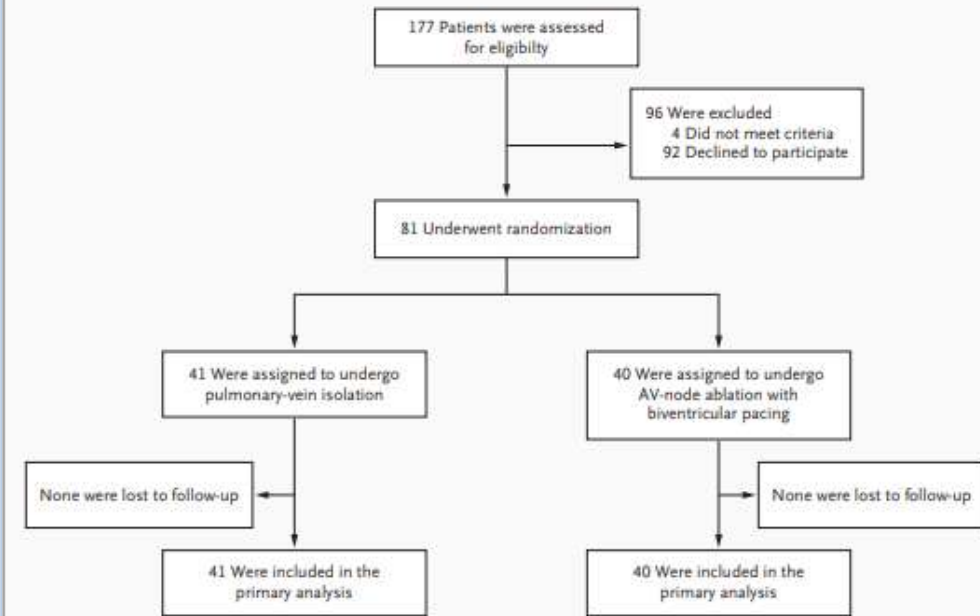


Figure 1. Enrollment and Follow-up of Study Patients.

AV denotes atrioventricular.

A 6 mois, le groupe ablation PVI montre 88% AF free et augmentation de FEVG de 8% par rapport à la stimulation biv et ablation du NAV ( $p < 0.001$ ).

Amélioration des capacités fonctionnelles basés sur test de marche de 6 min et de QOL en faveur de l'ablation de PVI



## Clinical characteristics and cardiovascular outcomes in patients with atrial fibrillation receiving rhythm-control therapy: the Fushimi AF Registry

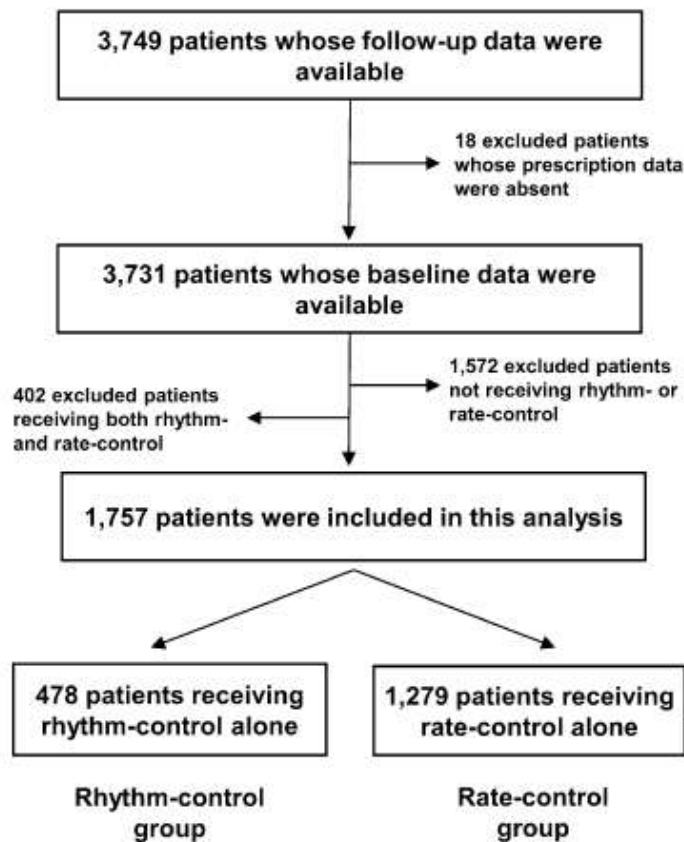
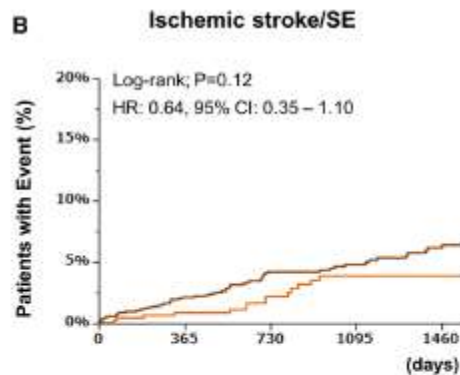
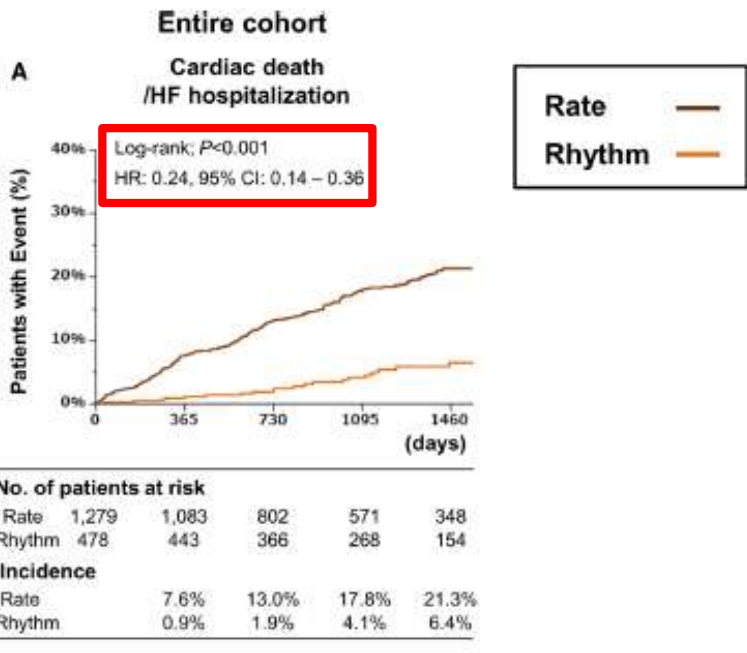


Fig. 1 Patient flowchart for the present analysis

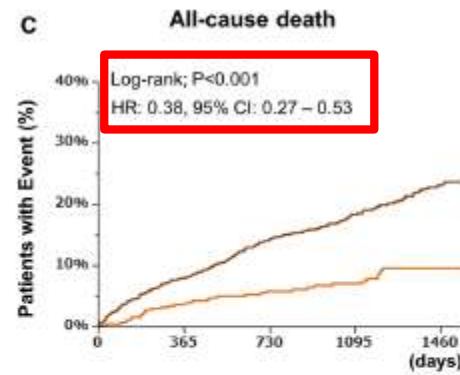


No. of patients at risk

|        | 0     | 365   | 730 | 1095 | 1460 |
|--------|-------|-------|-----|------|------|
| Rate   | 1,279 | 1,130 | 858 | 629  | 389  |
| Rhythm | 478   | 443   | 364 | 268  | 157  |

Incidence

|        | 0 | 365  | 730  | 1095 | 1460 |
|--------|---|------|------|------|------|
| Rate   |   | 2.1% | 4.2% | 4.8% | 6.2% |
| Rhythm |   | 0.9% | 2.2% | 3.9% | 3.9% |



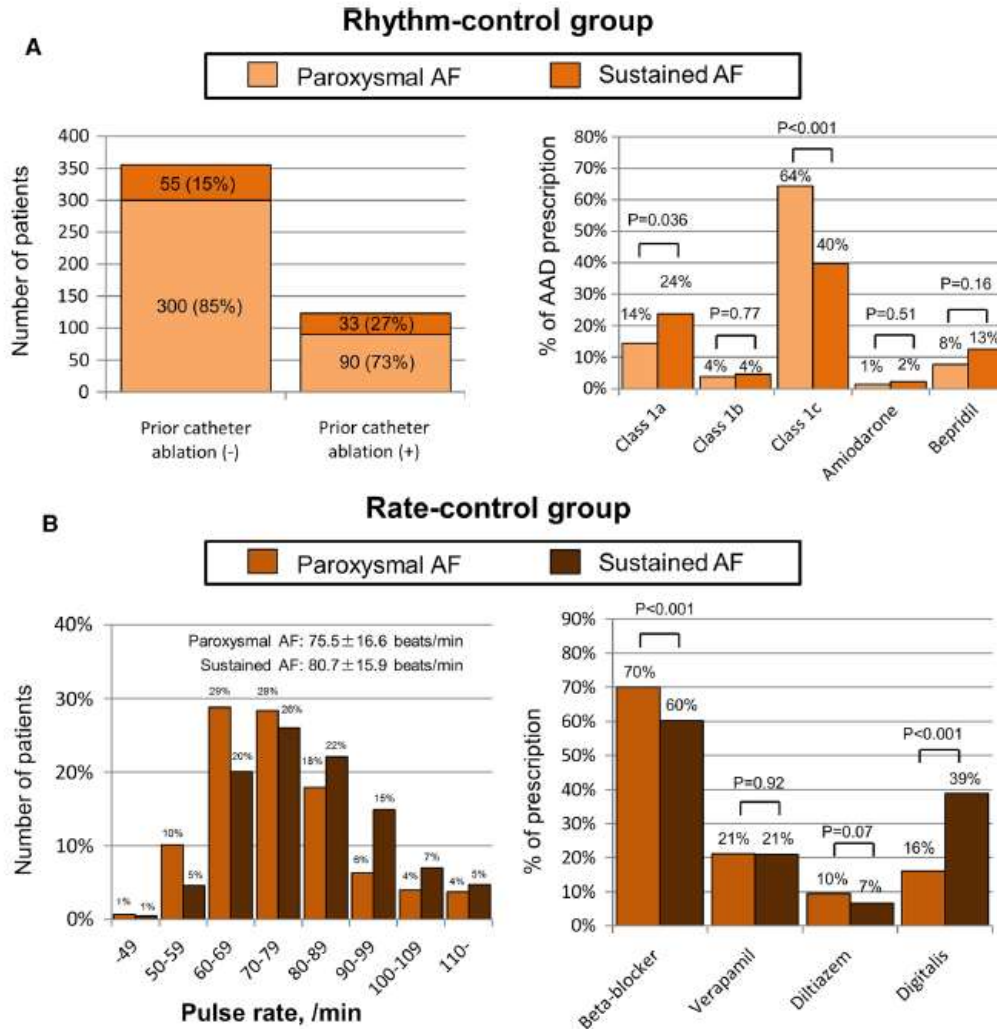
No. of patients at risk

|        | 0     | 365   | 730 | 1095 | 1460 |
|--------|-------|-------|-----|------|------|
| Rate   | 1,279 | 1,147 | 883 | 649  | 406  |
| Rhythm | 478   | 446   | 371 | 278  | 162  |

Incidence

|        | 0 | 365  | 730   | 1095  | 1460  |
|--------|---|------|-------|-------|-------|
| Rate   |   | 7.9% | 14.2% | 18.3% | 23.1% |
| Rhythm |   | 3.6% | 5.7%  | 7.0%  | 9.6%  |

adjusted Kaplan-Meier curves for the incidences of **a** ischemic stroke/SE, **b** cardiac death/HF hospitalization, **c** all-cause death, and **d** death/HF hospitalization between Rhythm- and Rate-control groups. SE: systemic embolism, HF: heart failure



L'ablation de la FA est une technique attractive pour restaurer le rythme sinusal sans exposer les patients aux risques d'utilisation des AAR au long terme.

# Apport de l'ablation de la FA



| Etude                               | anselmino             | ullah                                    | PABA-CHF                                | macdonald                         | ARC-HF                             | CAMTAF                                      | AATAC                                                    | CAMERA-MRI                               | CASTLE-AF                                                                     |
|-------------------------------------|-----------------------|------------------------------------------|-----------------------------------------|-----------------------------------|------------------------------------|---------------------------------------------|----------------------------------------------------------|------------------------------------------|-------------------------------------------------------------------------------|
| design                              | observati<br>onnelle  | observati<br>onnelle                     | RCT                                     | RCT                               | RCT                                | RCT                                         | RCT                                                      | RCT                                      | RCT                                                                           |
| Année de<br>pub                     | 2014                  | 2016                                     | 2008                                    | 2011                              | 2013                               | 2014                                        | 2016                                                     | 2017                                     | 2018                                                                          |
| Bras de<br>comparai<br>son          | non                   | non                                      | Ablation<br>NAV<br>versus biv<br>stim   | Contrôle<br>de RS<br>sous tt      | Contrôle<br>de RS<br>sous tt       | Contrôle<br>de RS<br>sous tt                | amiodaro<br>ne                                           | Contrôle<br>de RS<br>sous tt             | Tt<br>médical<br>avec<br>contrôle<br>du<br>rythme<br>recomm<br>né             |
| patients                            | 1838                  | 171 (avec<br>IC)                         | 81                                      | 41                                | 52                                 | 55                                          | 203                                                      | 68                                       | 179                                                                           |
| Fa persist                          | 55                    | 64                                       | 51                                      | 100                               | 100                                | 100                                         | 100                                                      | 72                                       | 70                                                                            |
| Suivi moy<br>(mois)                 | 23                    | 43                                       | 6                                       | 6                                 | 12                                 | 12                                          | 24                                                       | 6                                        | 37                                                                            |
| Méthode<br>de<br>détection<br>de FA | Non<br>applicabl<br>e | Holter à<br>3, 6 mois<br>et si<br>necess | Monitora<br>ge evt<br>entre 2 et<br>6 m | Holter de<br>24h à 3 et<br>6 mois | Holter de<br>48h à 6 et<br>12 mois | Holter de<br>48h à 1,<br>3, 6 et 12<br>mois | Interrogat<br>ion du<br>pace à 3,<br>6, 12 et<br>24 mois | moniteur<br>cardiaque<br>implanta<br>ble | Interrogat<br>ion des<br>pace/ dai<br>à 3,6, 12,<br>24, 36,<br>48, 60<br>mois |

RESEARCH ARTICLE

Open Access



# Catheter ablation for treatment of patients with atrial fibrillation and heart failure: a meta-analysis of randomized controlled trials

- 7 études randomisées ont été inclus soit 856 patients à cette méta-analyse

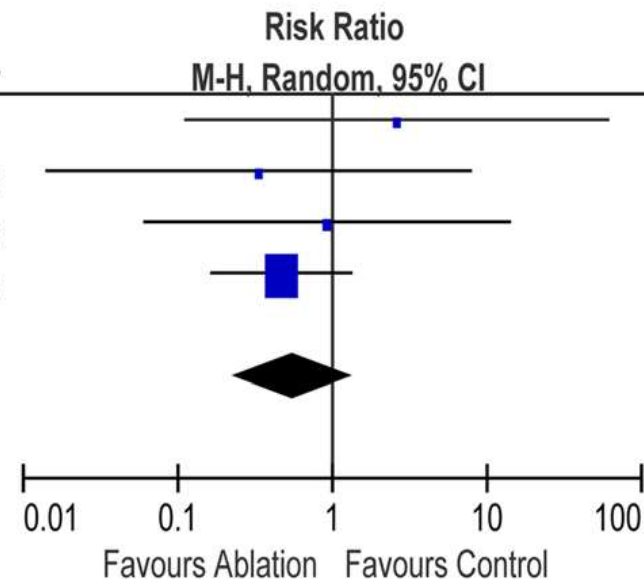
# Catheter ablation for treatment of patients with atrial fibrillation and heart failure: a meta-analysis of randomized controlled trials

Yingxu Ma<sup>†</sup>, Fan Bai<sup>†</sup>, Fen Qin, Yixi Li, Tao Tu, Chao Sun, Shenghua Zhou and Qiming Liu<sup>\*†</sup>



**D**

| Study or Subgroup                                                                       | Ablation |            | Control |            | Weight        | Risk Ratio               |  | Year |
|-----------------------------------------------------------------------------------------|----------|------------|---------|------------|---------------|--------------------------|--|------|
|                                                                                         | Events   | Total      | Events  | Total      |               | M-H, Random, 95% CI      |  |      |
| MacDonald 2011                                                                          | 1        | 22         | 0       | 19         | 8.0%          | 2.61 [0.11, 60.51]       |  | 2011 |
| Jones 2013                                                                              | 0        | 26         | 1       | 26         | 7.9%          | 0.33 [0.01, 7.82]        |  | 2013 |
| Hunter 2014                                                                             | 1        | 26         | 1       | 24         | 10.7%         | 0.92 [0.06, 13.95]       |  | 2014 |
| Marrouche 2018                                                                          | 5        | 179        | 11      | 184        | 73.4%         | 0.47 [0.17, 1.32]        |  | 2018 |
| <b>Total (95% CI)</b>                                                                   |          | <b>253</b> |         | <b>253</b> | <b>100.0%</b> | <b>0.56 [0.23, 1.36]</b> |  |      |
| Total events                                                                            | 7        |            | 13      |            |               |                          |  |      |
| Heterogeneity: $\tau^2 = 0.00$ ; $\chi^2 = 1.27$ , $df = 3$ ( $P = 0.74$ ); $I^2 = 0\%$ |          |            |         |            |               |                          |  |      |
| Test for overall effect: $Z = 1.27$ ( $P = 0.20$ )                                      |          |            |         |            |               |                          |  |      |

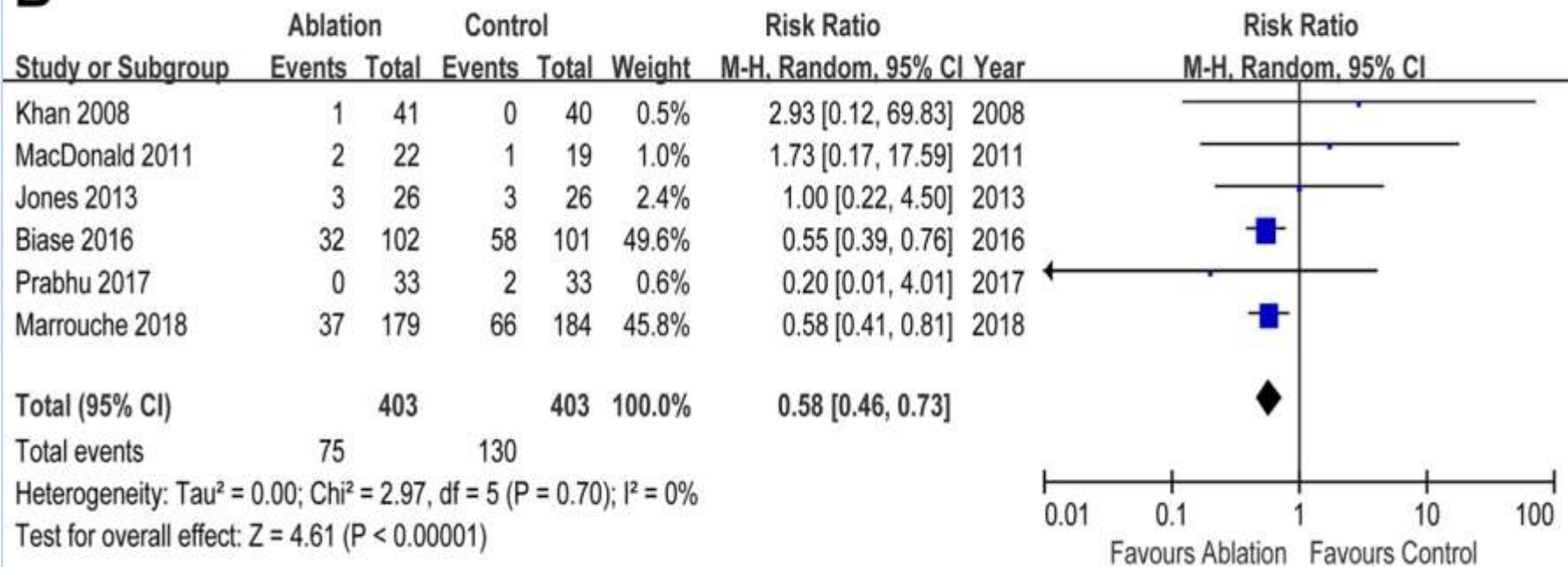


- Pas de différences significative en terme d'AVC entre les deux groupes.

# Catheter ablation for treatment of patients with atrial fibrillation and heart failure: a meta-analysis of randomized controlled trials

Yingxu Ma<sup>†</sup>, Fan Bai<sup>†</sup>, Fen Qin, Yixi Li, Tao Tu, Chao Sun, Shenghua Zhou and Qiming Liu<sup>\*†</sup>

**B**

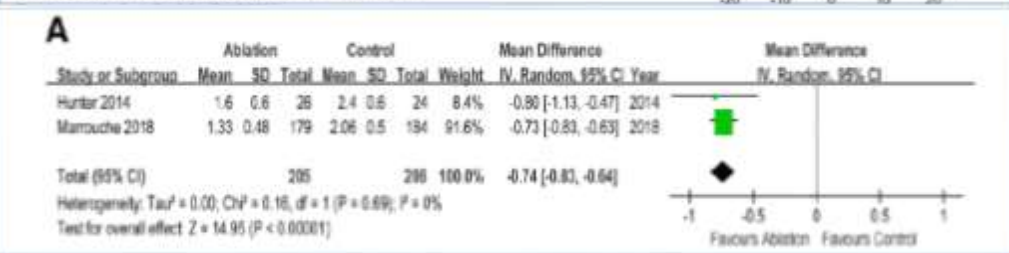
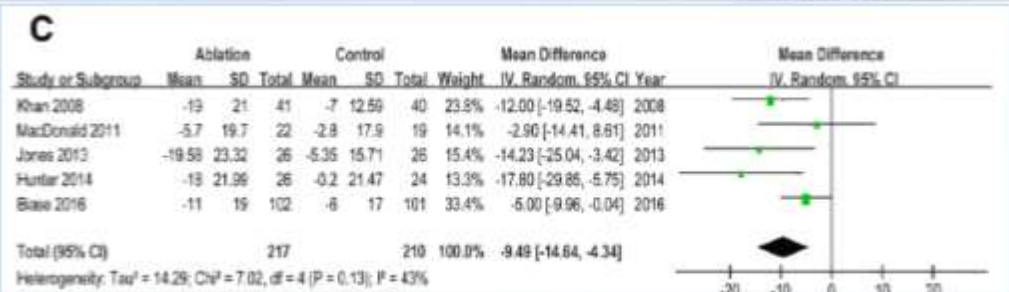
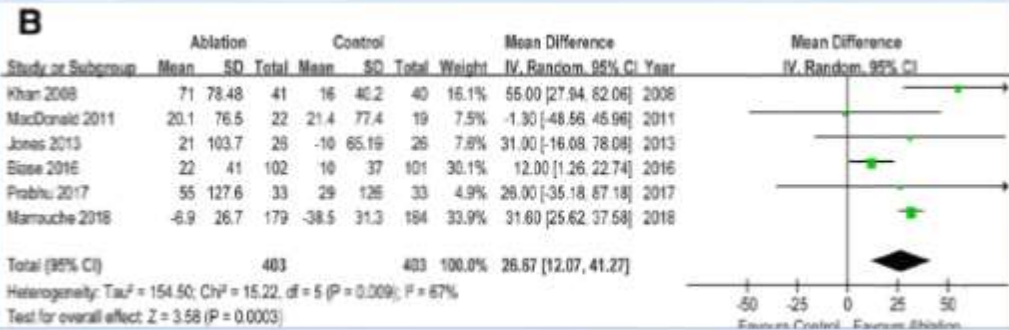
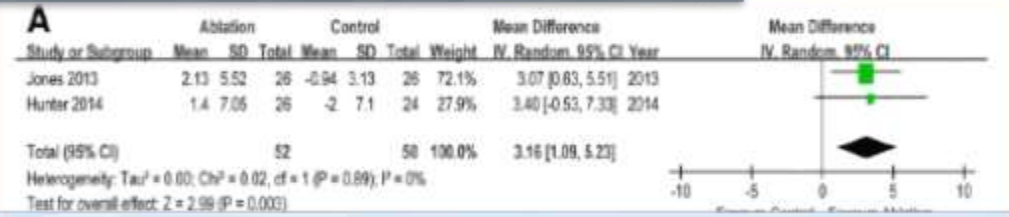


- Réduction de la Ré-hospitalisation pour IC

# Catheter ablation for treatment of patients with atrial fibrillation and heart failure: a meta-analysis of randomized controlled trials

Yingxu Ma<sup>†</sup>, Fan Bai<sup>†</sup>, Fen Qin, Yixi Li, Tao Tu, Chao Sun, Shenghua Zhou and Qiming Liu<sup>\*†</sup>

- Amélioration du pic de VO<sub>2</sub>
- Amélioration du test de 6 min
- Diminution du questionnaire basé sur le score de Minnesota concernant les patients IC
- Amélioration de la classe NYHA



# Catheter ablation for treatment of patients with atrial fibrillation and heart failure: a meta-analysis of randomized controlled trials

Yingxu Ma<sup>†</sup>, Fan Bai<sup>†</sup>, Fen Qin, Yixi Li, Tao Tu, Chao Sun, Shenghua Zhou and Qiming Liu<sup>\*†</sup>

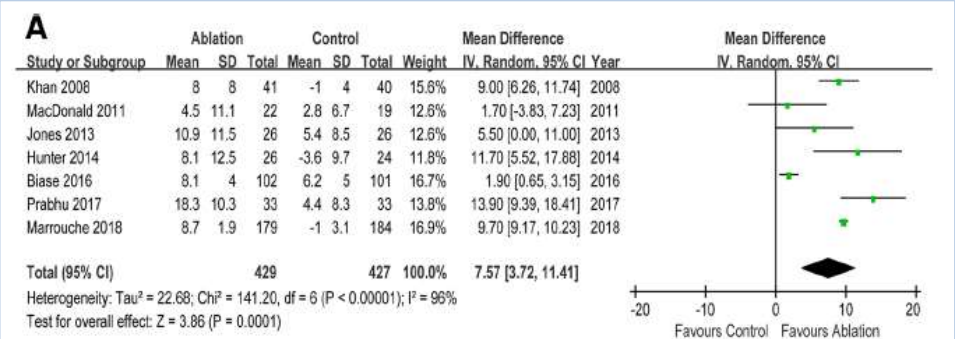
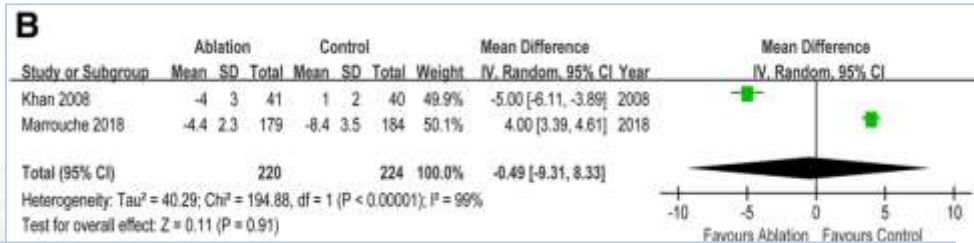
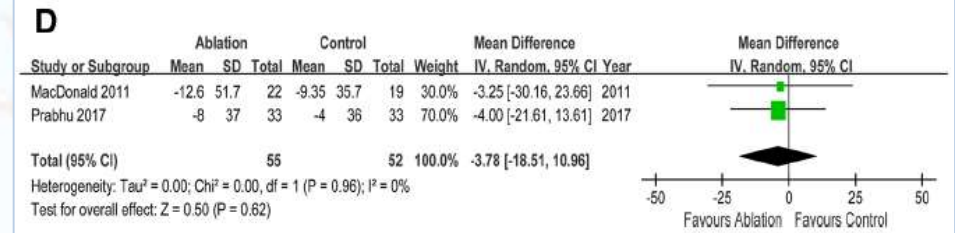
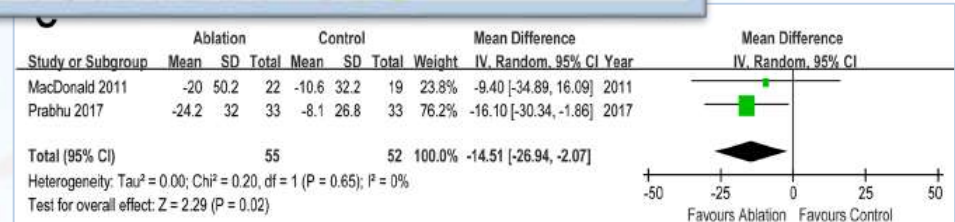
- Amélioration du VTSVG

- Amélioration du VTDVG

- Diamètre de l'OG

- Amélioration de la FEVG

- Diminution de BNP



# Catheter ablation for treatment of patients with atrial fibrillation and heart failure: a meta-analysis of randomized controlled trials

Yingxu Ma<sup>†</sup>, Fan Bai<sup>†</sup>, Fen Qin, Yixi Li, Tao Tu, Chao Sun, Shenghua Zhou and Qiming Liu<sup>\*†</sup>

**A**

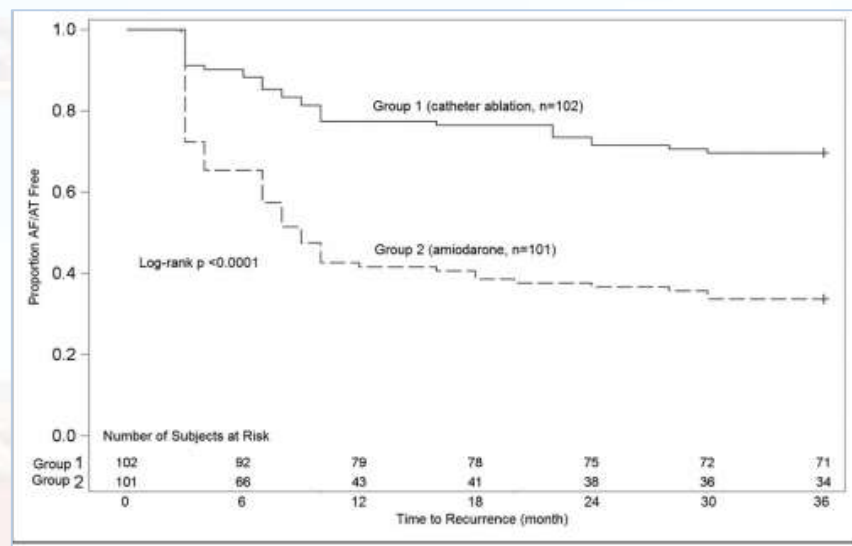
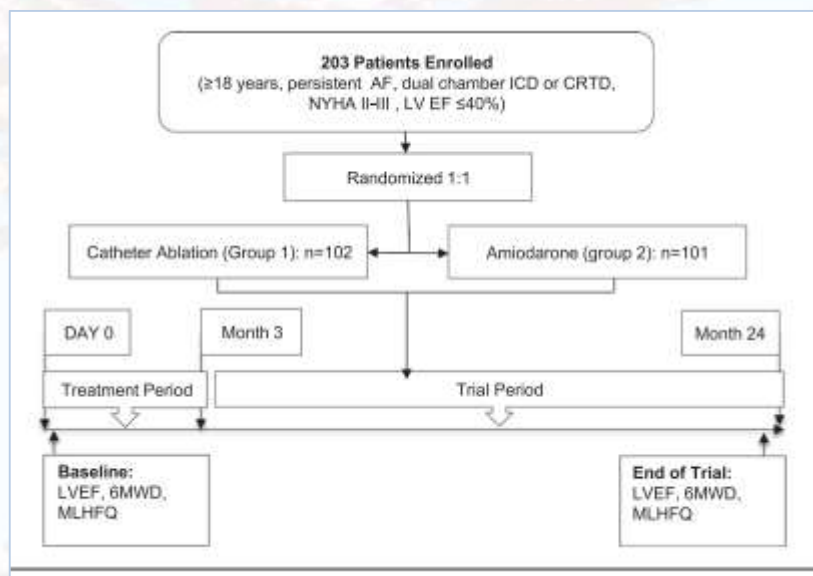


- Réduction de la de la mortalité toutes causes confondues

## Arrhythmia/Electrophysiology

### Ablation Versus Amiodarone for Treatment of Persistent Atrial Fibrillation in Patients With Congestive Heart Failure and an Implanted Device

Results From the AATAC Multicenter Randomized Trial



Elle a montré une supériorité de l'ablation par rapport à l'amiodarone pour le maintien du RS.

## Arrhythmia/Electrophysiology

### Ablation Versus Amiodarone for Treatment of Persistent Atrial Fibrillation in Patients With Congestive Heart Failure and an Implanted Device

Results From the AATAC Multicenter Randomized Trial

**Table 3. Change in LVEF, 6MWD, and MLHFQ Score by Recurrence Status**

|              | No Recurrence (n=91) |                 | Recurrence (n=86) |                 | P (Comparing Change Between Groups) |
|--------------|----------------------|-----------------|-------------------|-----------------|-------------------------------------|
|              | Baseline             | Change (Median) | Baseline          | Change (Median) |                                     |
| LVEF, %      | 28.8±10              | 9.6±7.4 (9.4)   | 30.2±9            | 4.2±6.2 (4.0)   | <0.001                              |
| 6MWD, meters | 347±113              | 27±38 (24)      | 352±128           | 8±42 (2)        | <0.001                              |
| MLHFQ        | 53±24                | -14±18 (-12)    | 49±26             | -2.9±15 (-2.2)  | <0.001                              |

Data are summarized as mean±standard deviation. LVEF indicates left ventricular ejection fraction; MLHFQ, Minnesota Living with Heart Failure Questionnaire; and 6MWD, 6-minute walk distance.

### Conclusion

This multicenter randomized study shows that catheter ablation of AF is superior to AMIO in achieving freedom from AF at long-term follow-up and reducing unplanned hospitalization and mortality in patients with HF and persistent AF. The potential socioeconomic repercussion of these results will require further investigation.

Amélioration de la FEVG chez les patients présentant une FA persistante.

Une réduction de taux de mortalité : (7.8% versus 18% mortality).

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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 Bärsch, M.D., for the CASTLE-AF Investigators\*

FA paroxystique, persistante  
Résistante AAR et/ ou effets indésirables AAR  
Dysfonction VG <35%  
Symptomatique de NYHA II, III, IV avec ou sans DAI.

179 patients  
ablation de FA

184 patients  
traitement  
antiarythmiques

MARROUCHE AND BRACHMANN

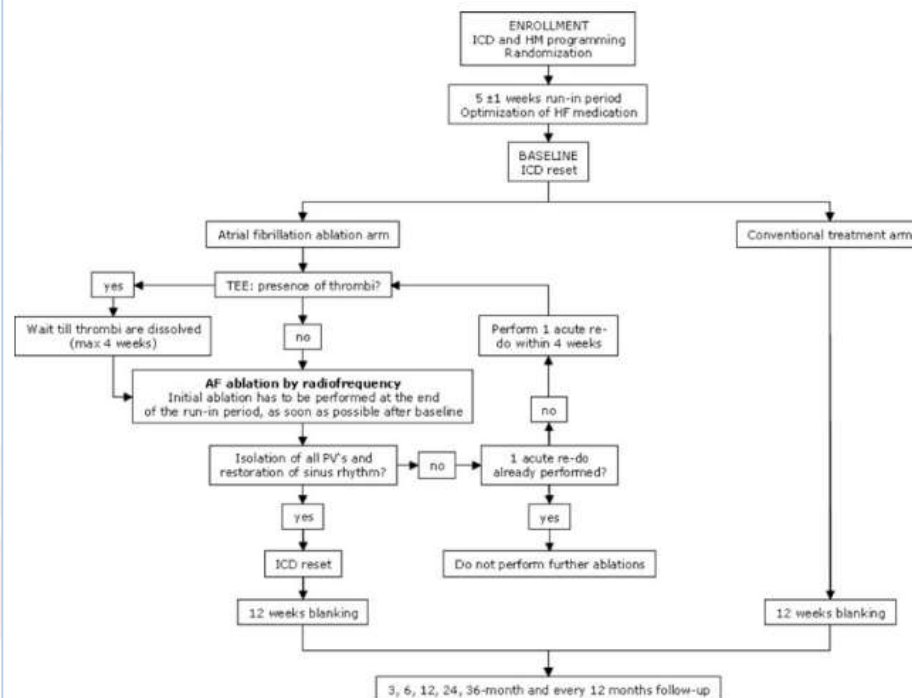
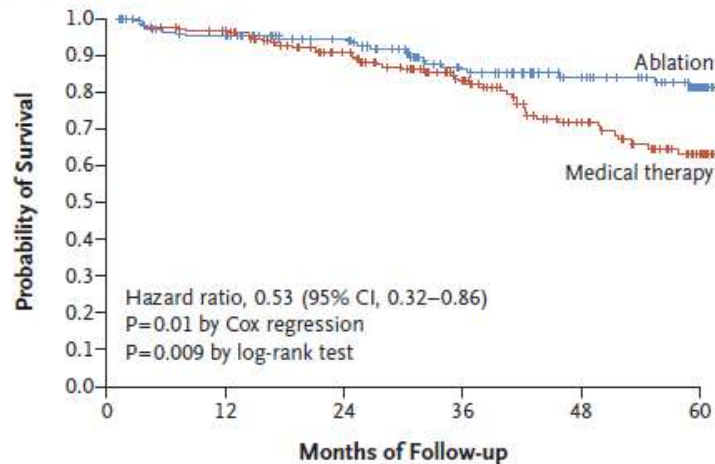


Figure 1. Study flow chart.

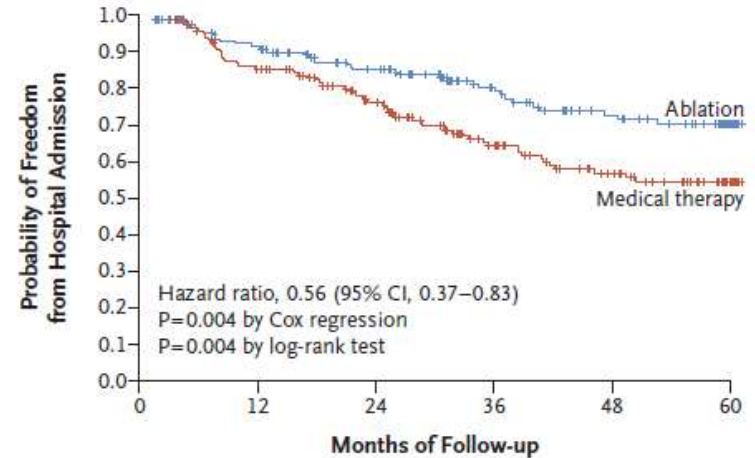
Objectif: comparer la mortalité toute confondue et réhospitalisation pour IC entre les deux groupes

# Sur un suivi moyen de 37.8 mois

**B Death from Any Cause**



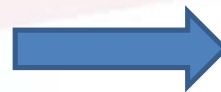
**C Hospitalization for Worsening Heart Failure**



Diminution de la mortalité totale de 46%

Baisse des hospitalisations pour insuffisance cardiaque

63% des patients étaient en RS à 60 mois de suivi contre 22% dans le groupe sous AAR



=> ceci suggère que le maintien du RS est bénéfique quand il est atteint sans l'utilisation des AAR

CASTLE-AF est la première étude randomisée à démontrer un bénéfice de l'ablation de fibrillation atriale dans l'insuffisance cardiaque à FEVG altérée avec des critères de jugements durs

|                                 | AF Burden per Patient (in % of Time) at Different Follow-Ups |             |             |             |             |             |             |             |
|---------------------------------|--------------------------------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
|                                 | Baseline                                                     | 3 M         | 6 M         | 12 M        | 24 M        | 36 M        | 48 M        | 60 M        |
| <b>Mean <math>\pm</math> SD</b> |                                                              |             |             |             |             |             |             |             |
| Ablation                        | 51 $\pm$ 47                                                  | 27 $\pm$ 39 | 23 $\pm$ 37 | 20 $\pm$ 38 | 23 $\pm$ 39 | 25 $\pm$ 40 | 27 $\pm$ 41 | 27 $\pm$ 42 |
| Pharmacological                 | 51 $\pm$ 46                                                  | 51 $\pm$ 47 | 51 $\pm$ 46 | 52 $\pm$ 46 | 48 $\pm$ 47 | 50 $\pm$ 47 | 54 $\pm$ 47 | 64 $\pm$ 45 |
| <b>Median (IQR)</b>             |                                                              |             |             |             |             |             |             |             |
| Ablation                        | 62 (0-99)                                                    | 0 (0-60)    | 0 (0-30)    | 0 (0-12)    | 0 (0-24)    | 0 (0-31)    | 0 (0-65)    | 0 (0-62)    |
| Pharmacological                 | 64 (0-99)                                                    | 61 (0-99)   | 58 (0-99)   | 64 (0-99)   | 34 (0-99)   | 52 (0-99)   | 83 (0-99)   | 99 (4-99)   |
| <b>Patients<sup>†</sup></b>     |                                                              |             |             |             |             |             |             |             |
| Ablation – no.                  | 164                                                          | 152         | 151         | 150         | 121         | 89          | 64          | 48          |
| Pharmacological – no.           | 175                                                          | 166         | 155         | 166         | 129         | 91          | 60          | 36          |

Réduction significative en temps de charge de FA chez les patients ablatés



- une population très sélectionnée

|                             | CASTLE-AF | AATAC | ARC-HF | CAMTAF | PABA-HF | Macdonald trials |
|-----------------------------|-----------|-------|--------|--------|---------|------------------|
| Nb de patients introduits   | 3013      | 866   | 101    | 390    | 177     | 366              |
| Nb de patients sélectionnés | 398       | 203   | 52     | 55     | 81      | 41               |

- Exporter ces résultats à tous les patients ayant une association de FA avec IC

| Study              | RAFT-AF                                    | AFARC-LVF                           | CATCH-AF                         | AMICA                          |
|--------------------|--------------------------------------------|-------------------------------------|----------------------------------|--------------------------------|
| Inclusion Criteria | AF, BNP positive HF (HFpEF and HFrEF)      | Persistent AF, LVEF<35%             | AF, LVEF 25-35%                  | AF, ICD or CRT-D, LVEF<35%     |
| Target Enrolment   | 600                                        | 180                                 | 220                              | 216                            |
| Comparison Arm     | Interventional rate control                | Rate control                        | Rate control                     | Medical rate or rhythm control |
| Primary Outcomes   | All-Cause mortality and HF Hospitalization | Improvement to LVEF >35%, NYHA > II | HF Hospitalization, recurrent AF | LVEF by echocardiogram         |
| Follow up (months) | 24                                         | 12                                  | 12                               | 12                             |

**L'efficacité de la première procédure**

**40-69%**

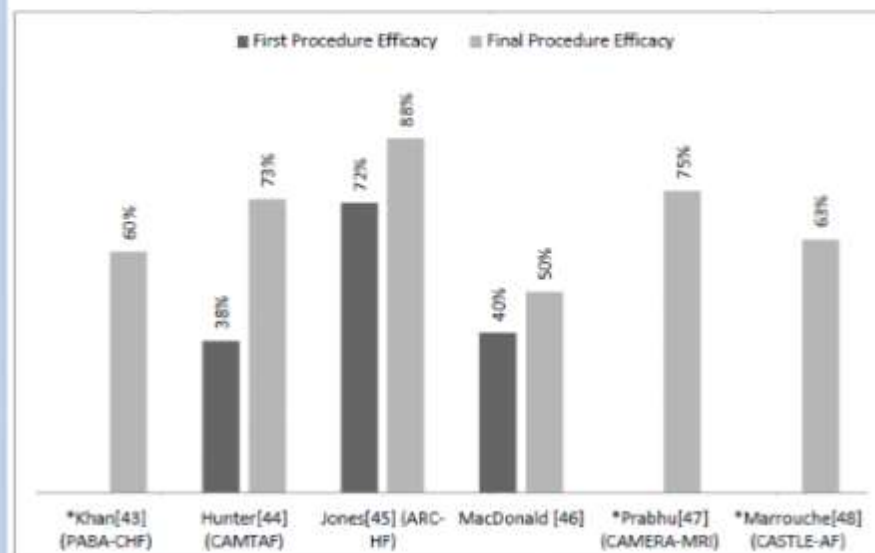
**Le taux de procédure moyen**

**1.54±0.79**

**Le taux de succès en multipliant le nombre de procédure**

**50 à 88%**

**Figure 1: First and Final procedure arrhythmia-free survival for ablation of atrial fibrillation in heart failure**



# Le taux de complications par patients est de 2.9-20%

**Table 3:** Summary of procedural complications across the principle studies

| First Author (acronym)                 | Patients (n)   | Median Procedure (per patient) | Complication Rate per Patient (%) | Complication per Procedure (%) | Death per Procedure (%) | Stroke per Procedure (%) | Tamponade Per Procedure (%) |
|----------------------------------------|----------------|--------------------------------|-----------------------------------|--------------------------------|-------------------------|--------------------------|-----------------------------|
| Anselmino <sup>41</sup>                | 1838           | 1.38                           | NR                                | 4.2 (3.6-4.8)                  | NR                      | NR                       | NR                          |
| Ullah <sup>45</sup>                    | 171<br>Only HF | 1.54                           | NR                                | 5<br>(in HF cohort)            | 0                       | 0.9                      | 2.5                         |
| Khan <sup>43</sup><br>(PABA-CHF)       | 41             | 1.2                            | 12                                | 10.2                           | 0                       | 0                        | 2                           |
| Macdonald <sup>46</sup>                | 20             | 1.3                            | 20                                | 14.8                           | 0                       | 3.7                      | 7.4                         |
| Jones <sup>45</sup><br>(ARC-HF)        | 25             | 1.2                            | 15                                | 10                             | 0                       | 0                        | 3.3                         |
| Hunter <sup>44</sup><br>(CAMTAF)       | 26             | 1.7                            | 7.7                               | 4.7                            | 0                       | 2.7                      | 2.7                         |
| Di Biase <sup>42</sup><br>(AATAC)      | 102            | 1.4                            | 2.9                               | 2.1                            | 0                       | 0                        | 1                           |
| Prabhu <sup>47</sup><br>(CAMERA-MRI)   | 33             | NR                             | 6.1                               | NR                             | 0                       | 0                        | 0                           |
| Marrouche <sup>48</sup><br>(CASTLE-AF) | 151            | 1.3                            | 9.9                               | 7.7                            | 0                       | 0                        | 1.5                         |

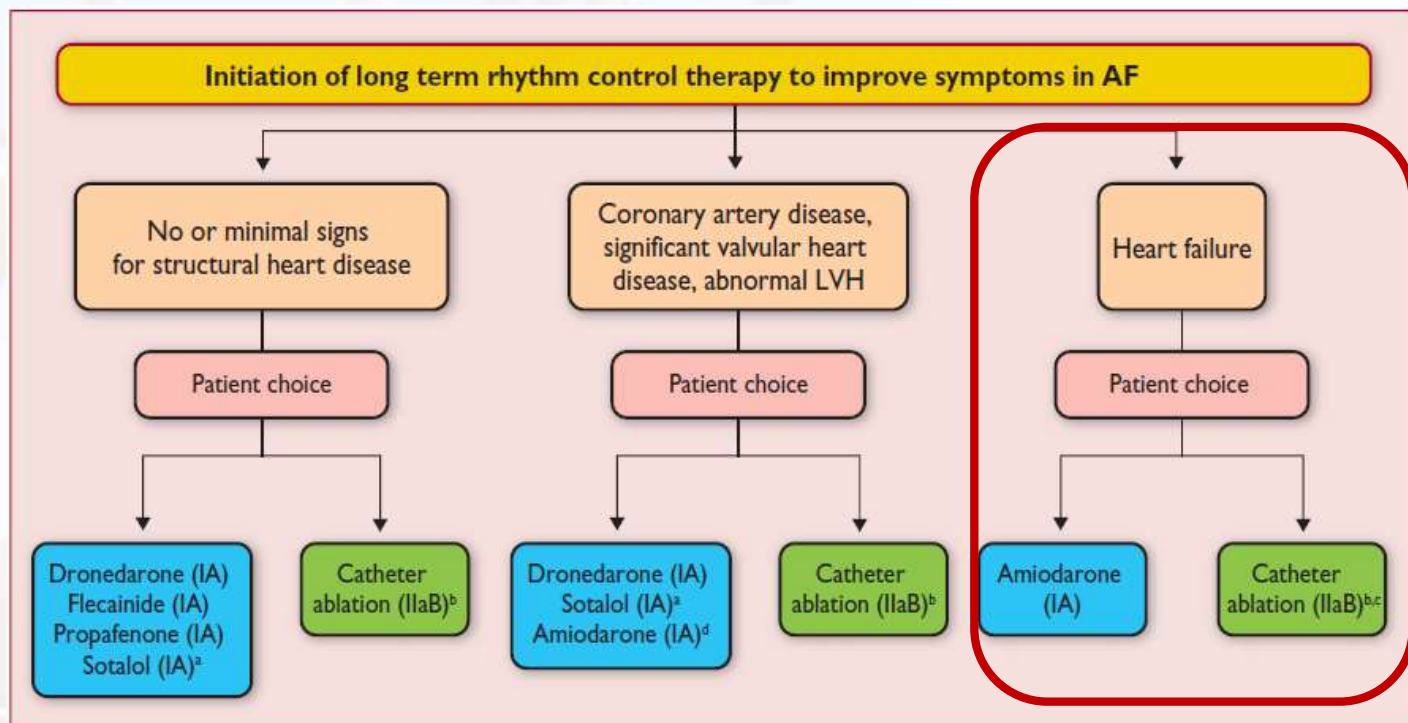
# Réduction de la charge en FA

- L'amélioration clinique suite à l'ablation de la FA en IC peut survenir par la diminution de la charge de FA que par l'élimination de la FA
- Seulement, on ne sait pas le temps de charge nécessaire pour avoir un bénéfice sur l'IC

# La sélection des patients pour ablation



## 2016 ESC Guidelines for the management of atrial fibrillation developed in collaboration with EACTS



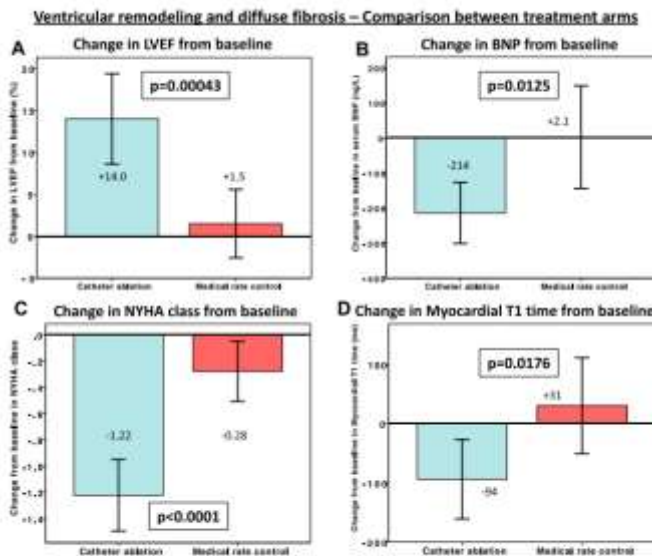
- Pas de recommandations:
  - les patients en bonne santé avec
  - une charge en FA importante
  - nécessitant le retour en rythme sinusal pour améliorer les symptômes et la qualité de vie
  - ne présentant pas de fibrose.

# Regression of Diffuse Ventricular Fibrosis Following Restoration of Sinus Rhythm With Catheter Ablation in Patients With Atrial Fibrillation and Systolic Dysfunction

A Substudy of the CAMERA MRI Trial

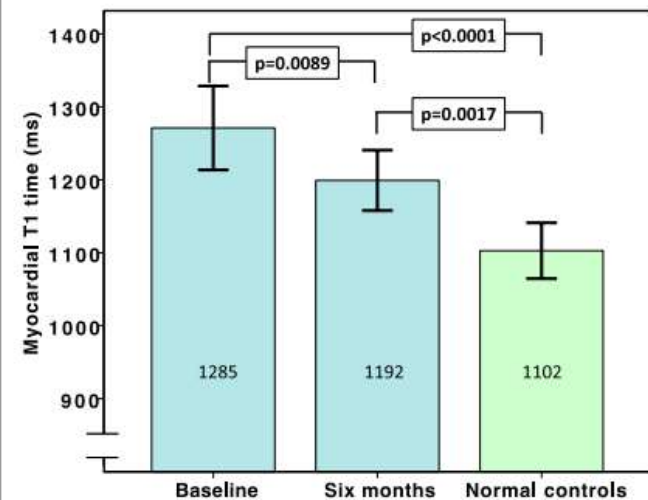


FIGURE 1 Comparison of 6-Month Outcomes by Treatment Arm



Catheter ablation was associated with (A) a significant improvement in LVEF, (B) a reduction in serum BNP, and (C) a reduction in NYHA functional class. (D) This was accompanied by a reduction in myocardial T1 times consistent with a regression of diffuse fibrosis. Bars represent 95% confidence intervals. BNP = brain natriuretic peptide; LVEF = left ventricular ejection fraction; NYHA = New York Heart Association.

FIGURE 2 Myocardial T1 Times in the Catheter Ablation Arm Compared With Normal Controls



Significant improvement is seen from baseline to 6 months; however, T1 times are still significantly higher at 6 months compared with normal controls. Bars = 95% confidence intervals.

L'absence de cicatrice est un élément prédictif de l'amélioration de la FEVG et s'associe à une amélioration de FEVG

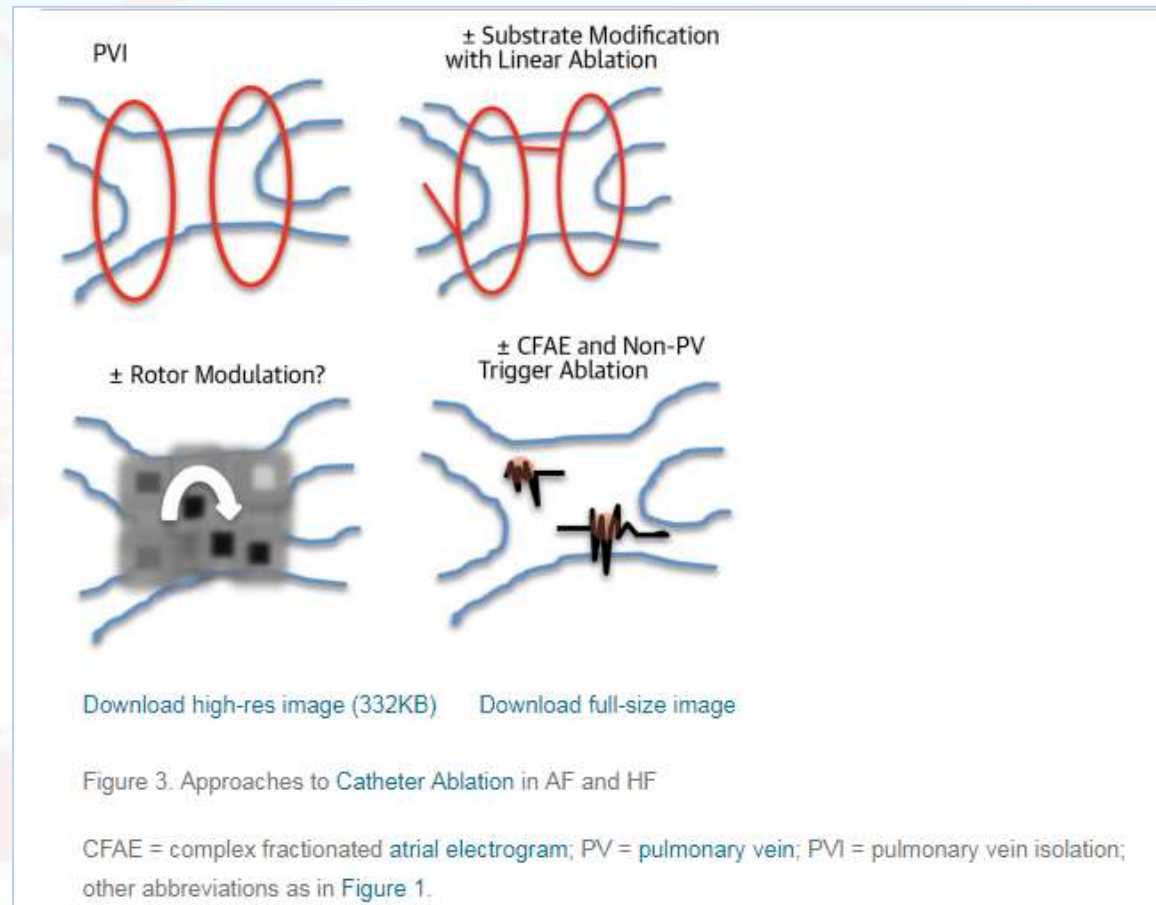


# Stratégie de l'ablation de FA



# Stratégies de l'ablation

- PVI
- CAFE
- Rotor
- Cicatrice
- Paroi postérieure
- Les lignes



# Stratégies de l'ablation

## AATAC Multicenter Randomized Trial

## CASTLE-AF

### CATHETER ABLATION

The aim of the ablation procedure was to achieve isolation of all pulmonary veins and to restore sinus rhythm (see the Supplementary Appendix). Additional ablation lesions were made at the discretion of the operators. All the

In the 102 patients undergoing catheter ablation, PVI was performed in 22 patients, and PVI plus posterior wall isolation was done in 80 patients. The total procedure time and radio-frequency time were  $168 \pm 72$  and  $66 \pm 34$  minutes, respectively.

**Le bénéfice de chaque approche est incertain.**



STCCCV

Société Tunisienne  
de Cardiologie & de Chirurgie  
Cardio-Vasculaire

JACC VOL. 64, NO. 7, 2014

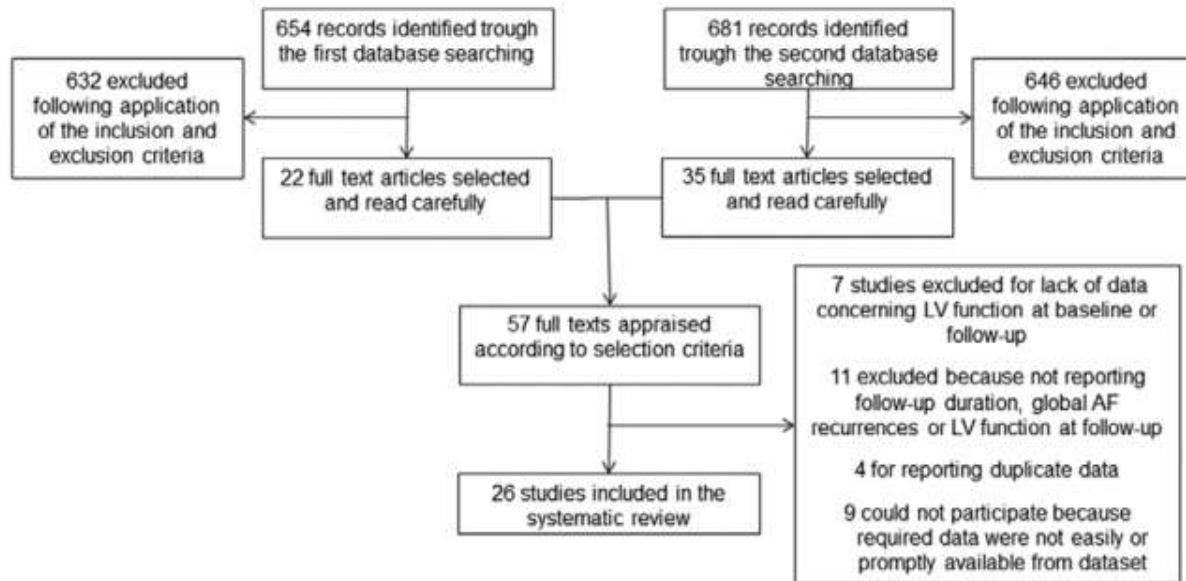


CoSAC

Le congrès des  
Sociétés Africaines  
de Cardiologie

## Catheter Ablation of Atrial Fibrillation in Patients With Left Ventricular Systolic Dysfunction A Systematic Review and Meta-Analysis

Matteo Anselmino, MD, PhD; Mario Matta, MD; Fabrizio D'Ascenzo, MD; T. Jared Bunch, MD; Richard J. Schilling, MD; Ross J. Hunter, MD, PhD; Carlo Pappone, MD, PhD; Thomas Neumann, MD; Georg Noelker, MD; Martin Fiala, MD, PhD; Emanuele Bertaglia, MD; Antonio Frontera, MD; Edward Duncan, MD; Chrishan Nalliah, BSc, MBBS; Pierre Jais, MD; Rukshen Weerasooriya, MD; Jon M. Kalman, MD, PhD; Fiorenzo Gaita, MD



**Figure 1.** Search criteria and flow chart of the studies screened and included in the systematic review. AF indicates atrial fibrillation; and LV, left ventricular.

26 études observationnelles  
1838 patients

- altération modérée de la FEVG (FEVG moyenne de 40%) ,
- symptomatique de dyspnée stade III/IV de NYHA dans 35% des cas
- 55% présentant une FA persistante

45%

ablation par des lignes

54%

ablation des complexes fragmentés

Sur un suivi de 23 mois  
le taux de succès est de 40% arrivant à 60% en augmentant le nombre des procédures

**Table 2. Procedural Features and Efficacy Rates of Atrial Fibrillation Catheter Ablation in the Selected Studies (1838 Patients)**

|                                                   | Mean Value (Lower–Upper 95% Confidence Interval) |
|---------------------------------------------------|--------------------------------------------------|
| <b>First procedure</b>                            |                                                  |
| PV isolation, %                                   | 100 (100–100)                                    |
| PV isolation alone, %                             | 55 (51–76)                                       |
| Left isthmus line, %                              | 35 (10–50)                                       |
| Roof line, %                                      | 46 (34–48)                                       |
| CFAE, %                                           | 5.0 (1.0–7.0)                                    |
| Fluoroscopy time, min                             | 39 (24–64)                                       |
| Procedural time, h                                | 3.1 (2.6–3.8)                                    |
| Postprocedural cardioversion, %                   | 53 (30–65)                                       |
| Overall complications, %                          | 4.2 (3.6–4.8)                                    |
| Access site complications, %                      | 2.0 (1.0–2.5)                                    |
| Stroke/TIA, %                                     | 1.0 (0.6–1.5)                                    |
| Cardiac tamponade, %                              | 1.2 (0.6–1.5)                                    |
| Others, %                                         | 1.2 (0.7–1.6)                                    |
| <b>Redo procedures, 32% (24%–36%) of patients</b> |                                                  |
| Time after first procedure, mo                    | 12 (9.0–15)                                      |
| PV isolation, %                                   | 100 (100–100)                                    |
| PV isolation alone, %                             | 46 (43–56)                                       |
| Left isthmus line, %                              | 25 (21–29)                                       |
| Roof line, %                                      | 35 (31–34)                                       |
| CFAE, %                                           | 5.0 (1.0–7.0)                                    |
| First procedure efficacy, %                       | 40 (36–44)                                       |
| Final efficacy, %                                 | 60 (54–67)                                       |

CFAE indicates complex fractionated atrial electrograms; PV, pulmonary veins; and TIA, transient ischemic attack.

# Conclusion

- L'association de FA et de IC est fréquente et présente un challenge pour le cardiologue dans leur prise en charge.
- L'ablation de la FA est un moyen thérapeutique pour maintenir le RS chez les patients IC en FA.
- Le maintien du rythme sinusal paraît plus avantageux par l'ablation de la FA que par l'utilisation des anti-arythmiques chez les patients en IC
- Même si cette option permet de maintenir le rythme sinusal de façon modéré après une simple procédure, la charge en FA diminue.



**Merci pour  
votre  
attention**

