# MANEJO DE LA FIBRILACIÓN AURICULAR EN DISTINTOS ESCENARIOS CLÍNICOS

GdT ARRITMIAS Y SÍNCOPE SEMES-ANDALUCÍA

Coordinación Francisco Ruiz Romero – Ángel Álvarez Márquez

NOVIEMBRE 2022

Grupo de ArriTmias SíncoPe SEMESANDALUCÍA

# ESCENARIO 5

# ANTICOAGULACIÓN EN PERICARDIVERSIÓN

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GdT ARRITMIAS Y SÍNCOPE SEMES-ANDALUCÍA

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# ¿POR QUÉ CARDIOVERTIR?

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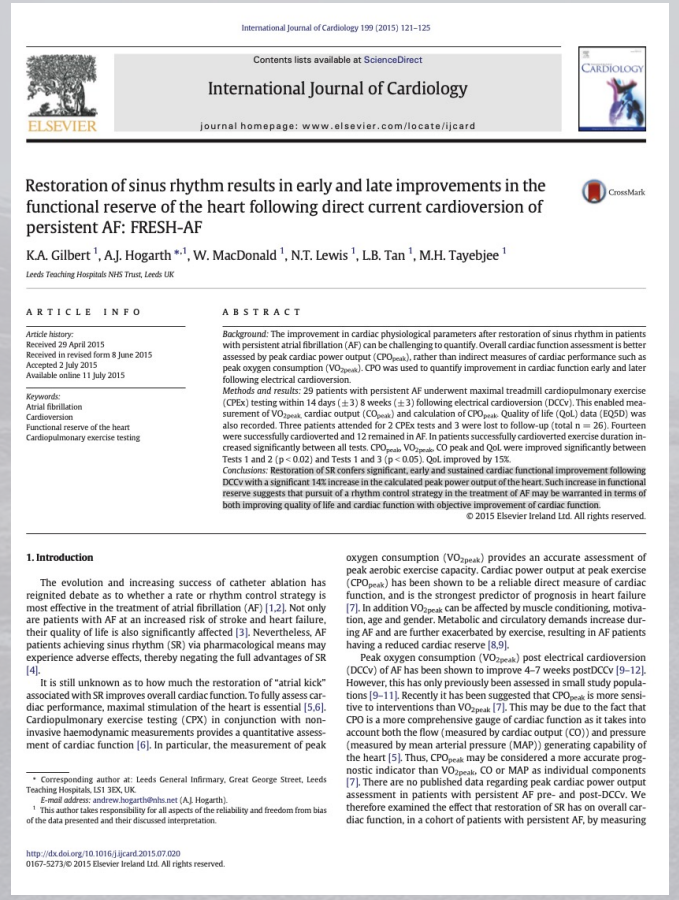
**Estados Preclínicos**

**Formas persistentes o Permanentes**

# ¿POR QUÉ CARDIOVERTIR?

- **MEJORA LA FUNCIONALIDAD CARDIACA**
- **IMPACTO EN CALIDAD DE VIDA**

# ¿POR QUÉ CARDIOVERTIR?



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Restoration of sinus rhythm results in early and late improvements in the functional reserve of the heart following direct current cardioversion of persistent AF: FRESH-AF

K.A. Gilbert [1], A.J. Hogarth *,[1], W. MacDonald [1], N.T. Lewis [1], L.B. Tan [1], M.H. Tayebjee [1]

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ABSTRACT

*Background:* The improvement in cardiac physiological parameters after restoration of sinus rhythm in patients with persistent atrial fibrillation (AF) can be challenging to quantify. Overall cardiac function assessment is better assessed by peak cardiac power output ($CPO_{peak}$), rather than indirect measures of cardiac performance such as peak oxygen consumption ($VO_{2peak}$). CPO was used to quantify improvement in cardiac function early and later following electrical cardioversion.

*Methods and results:* 29 patients with persistent AF underwent maximal treadmill cardiopulmonary exercise (CPEx) testing within 14 days (±3) 8 weeks (±3) following electrical cardioversion (DCCv). This enabled measurement of $VO_{2peak}$, cardiac output ($CO_{peak}$) and calculation of $CPO_{peak}$. Quality of life (QoL) data (EQ5D) was also recorded. Three patients attended for 2 CPEx tests and 3 were lost to follow-up (total n = 26). Fourteen were successfully cardioverted and 12 remained in AF. In patients successfully cardioverted exercise duration increased significantly between all tests. $CPO_{peak}$, $VO_{2peak}$, CO peak and QoL were improved significantly between Tests 1 and 2 ($p < 0.02$) and Tests 1 and 3 ($p < 0.05$). QoL improved by 15%.

*Conclusions:* Restoration of SR confers significant, early and sustained cardiac functional improvement following DCCv with a significant 14% increase in the calculated peak power output of the heart. Such increase in functional reserve suggests that pursuit of a rhythm control strategy in the treatment of AF may be warranted in terms of both improving quality of life and cardiac function with objective improvement of cardiac function.



**1. Introduction**

The evolution and increasing success of catheter ablation has reignited debate as to whether a rate or rhythm control strategy is most effective in the treatment of atrial fibrillation (AF) [1,2]. Not only are patients with AF at an increased risk of stroke and heart failure, their quality of life is also significantly affected [3]. Nevertheless, AF patients achieving sinus rhythm (SR) via pharmacological means may experience adverse effects, thereby negating the full advantages of SR [4].

It is still unknown as to how much the restoration of "atrial kick" associated with SR improves overall cardiac function. To fully assess cardiac performance, maximal stimulation of the heart is essential [5,6]. Cardiopulmonary exercise testing (CPX) in conjunction with non-invasive haemodynamic measurements provides a quantitative assessment of cardiac function [6]. In particular, the measurement of peak oxygen consumption ($VO_{2peak}$) provides an accurate assessment of peak aerobic exercise capacity. Cardiac power output at peak exercise ($CPO_{peak}$) has been shown to be a reliable direct measure of cardiac function, and is the strongest predictor of prognosis in heart failure [7]. In addition $VO_{2peak}$ can be affected by muscle conditioning, motivation, age and gender. Metabolic and circulatory demands increase during AF and are further exacerbated by exercise, resulting in AF patients having a reduced cardiac reserve [8,9].

Peak oxygen consumption ($VO_{2peak}$) post electrical cardioversion (DCCv) of AF has been shown to improve 4–7 weeks postDCCv [9–12]. However, this has only previously been assessed in small study populations [9–11]. Recently it has been suggested that $CPO_{peak}$ is more sensitive to interventions than $VO_{2peak}$ [7]. This may be due to the fact that CPO is a more comprehensive gauge of cardiac function as it takes into account both the flow (measured by cardiac output (CO)) and pressure (measured by mean arterial pressure (MAP)) generating capability of the heart [5]. Thus, $CPO_{peak}$ may be considered a more accurate prognostic indicator than $VO_{2peak}$, CO or MAP as individual components [7]. There are no published data regarding peak cardiac power output assessment in patients with persistent AF pre- and post-DCCv. We therefore examined the effect that restoration of SR has on overall cardiac function, in a cohort of patients with persistent AF, by measuring

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International Journal of Cardiology 199 (2015) 121–125

**Inicio**

**ETT**

- FEVI
- Diametro AI
- Diametro IVI
- Grosor pared VI

**Fin**

**ETT**

| | |
|---|---|
| **Prueba de Esfuerzo** | **Antes de la CV, 14días después y 8 semanas después** |
| **Encuesta QoL** | **Todas las visitas (registro EQVAS)** |
| **RESULTADOS** | **La restauración del RS confiera una mejora en la funcionalidad cardiaca y calidad de vida.** |

# ¿POR QUÉ CARDIOVERTIR?

- MEJORA LA FUNCIONALIDAD CARDIACA
- IMPACTO EN CALIDAD DE VIDA
- MENOR PROBABILIDAD DE RECURRENCIA
- TIEMPO PARA LA CARDIOVERSIÓN

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A comparison of early versus delayed elective electrical cardioversion for recurrent episodes of persistent atrial fibrillation: A multi-center study

Aleksandr Voskoboinik [a,b,c], Elana Kalman [c], George Plunkett [d], Jonathan Knott [d], Jeremy Moskovitch [c], Prashanthan Sanders [e], Peter M. Kistler [b,c,f], Jonathan M. Kalman [a,f,*]

ARTICLE INFO

ABSTRACT

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A comparison of early versus delayed elective electrical cardioversion for recurrent episodes of persistent atrial fibrillation: A multi-center study

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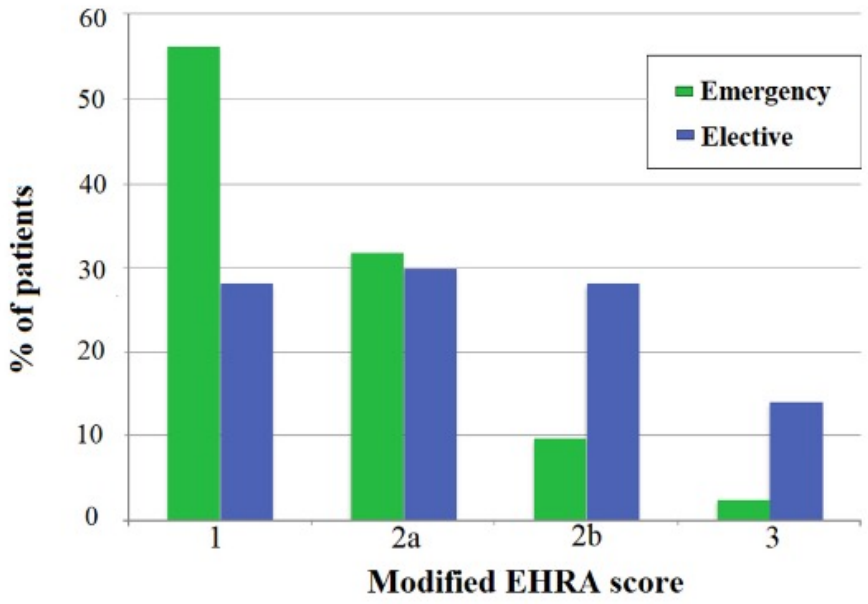


**Fig. 1.** Comparison of AF symptom severity at 12-months between both groups.

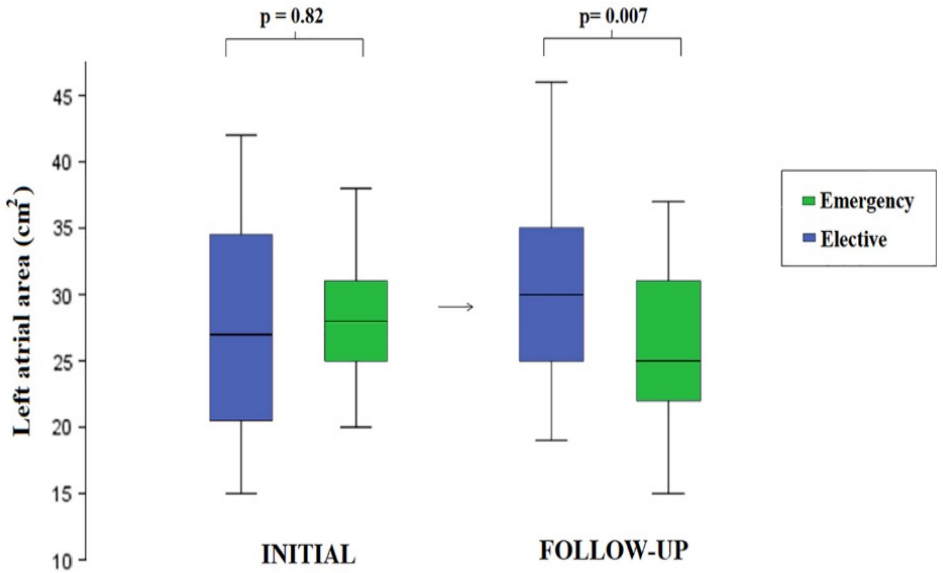


**Fig. 3.** Comparison between both groups with respect to atrial size at baseline and follow-up.

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Left atrium
Atrial remodeling

ABSTRACT

*Background:* Due to barriers to accessing timely elective electrical cardioversion (CV) for persistent AF (PeAF), we adopted a policy of instructing patients to present directly to the Emergency Department (ED) for CV.
*Objective:* We compare a strategy of Emergency CV (ED-CV) versus Elective CV (EL-CV) for treatment of symptomatic PeAF.
*Methods:* Between 2014 and 7, we evaluated 150 patients undergoing CV for PeAF. ED-CV patients were provided an AF action plan for recurrent symptoms and advised to present to ED within 36 h. EL-CV patients followed standard care, including cardiologist referral and placement on an elective hospital waiting list. Follow-up was 12 months.
*Results:* We included 75 consecutive ED-CV patients and 75 consecutive EL-CV patients. ED-CV patients had a significantly shorter median AF duration prior to CV (1 day vs 3 months; $p < 0.01$) and less overall AF-related symptoms at 12 months (modified EHRA symptom score ≥ 2a in 44% vs 72%; $p = 0.005$). Time to next AF recurrence was longer in the ED-CV group ($295 \pm 15$ vs $245 \pm 15$ days; logrank $p = 0.001$), as was time to AF ablation referral ($314 \pm 13$ vs $276 \pm 15$ days; logrank $p = 0.01$). Baseline LA area was similar (ED-CV $27 \pm 4$ cm² vs EL-CV $28 \pm 11$ cm²; $p = 0.67$), however EL-CV had larger atria at follow-up ($31 \pm 8$ vs $26 \pm 6$ cm²; $p = 0.01$). There were no complications in either group.
*Conclusion:* ED-CV is an acceptable strategy for symptomatic PeAF. In addition to reduced time spent in AF and improved symptom scores, this strategy may also slow progression of atrial substrate & delay onset of next AF episode.

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1. Background

As an emerging epidemic of cardiovascular disease, increasing numbers of patients are utilizing electrical cardioversion (CV) for treatment of symptomatic persistent atrial fibrillation (PeAF). The timing of CV following AF recurrence is dictated by a combination of factors, including patient symptoms, physician preference and resource availability. In addition to adverse effects on quality of life from prolonged AF duration, progressive adverse electrical and structural changes occur in the atria at different time points following arrhythmia onset [1]. The clinical implications of delayed CV for intermittent PeAF are not well categorized, although some studies suggest these patients are at higher risk of AF recurrence [2]. Due to barriers to accessing early elective cardioversion, including time taken to see a family physician, obtain specialist referral and wait for a scheduled CV, we adopted a policy of instructing patients to present directly to the Emergency department for early cardioversion.

We sought to compare a strategy of early 'Emergency' CV versus delayed 'Elective' CV for treatment of intermittent PeAF. We hypothesized that benefits of early CV may extend beyond symptoms, including prevention of adverse remodelling, reduction in recurrence risk and potentially lower utilization of AF ablation.

Abbreviations: AF, Atrial fibrillation; PeAF, Persistent atrial fibrillation; CV, Electrical cardioversion; LA, Left atrium; SD, Standard deviation; ED, Emergency department; ED-CV, Emergency cardioversion; EL-CV, Elective cardioversion.

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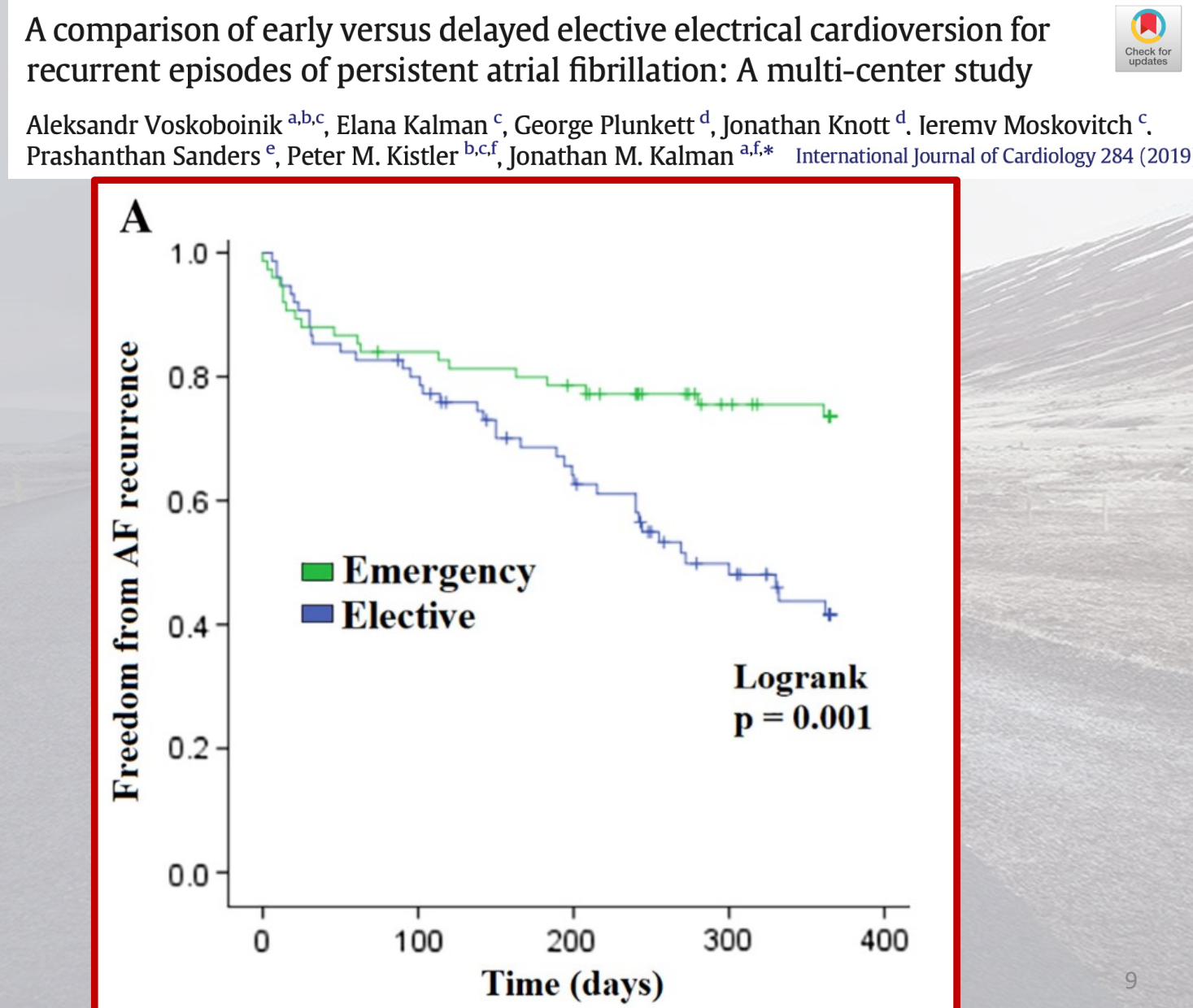
A comparison of early versus delayed elective electrical cardioversion for recurrent episodes of persistent atrial fibrillation: A multi-center study



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- TIEMPO PARA LA CARDIOVERSIÓN
- ¿DISMINUYE LA MORTALIDAD?

# ¿POR QUÉ CARDIOVERTIR?



RESEARCH

OPEN ACCESS

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## Cardioversion in patients with newly diagnosed non-valvular atrial fibrillation: observational study using prospectively collected registry data

Marita Knudsen Pope,[1,2] Trygve S Hall,[3] Valentina Schirripa,[4] Petra Radic,[5] Saverio Virdone,[6] Karen S Pieper,[6] Jean-Yves Le Heuzey,[7] Petr Jansky,[8] David A Fitzmaurice,[9] Riccardo Cappato,[10] Dan Atar,[1,3] A John Camm,[11] Ajay K Kakkar,[6] on behalf of the GARFIELD-AF investigators

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**ABSTRACT**

**OBJECTIVE**

To investigate the clinical outcomes of patients who underwent cardioversion compared with those who did not have cardioversion in a large dataset of patients with recent onset non-valvular atrial fibrillation.

**DESIGN**

Observational study using prospectively collected registry data (Global Anticoagulant Registry in the FIELD-AF—GARFIELD-AF).

**SETTING**

1317 participating sites in 35 countries.

**PARTICIPANTS**

52 057 patients aged 18 years and older with newly diagnosed atrial fibrillation (up to six weeks' duration) and at least one investigator determined stroke risk factor.

**MAIN OUTCOME MEASURES**

Comparisons were made between patients who received cardioversion and those who had no cardioversion at baseline, and between patients who received direct current cardioversion and those who had pharmacological cardioversion. Overlap propensity weighting with Cox proportional hazards models was used to evaluate the effect of cardioversion on clinical endpoints (all cause mortality, non-haemorrhagic stroke or systemic embolism, and major bleeding), adjusting for baseline risk and patient selection.

**RESULTS**

44 201 patients were included in the analysis comparing cardioversion and no cardioversion, and of these, 6595 (14.9%) underwent cardioversion at baseline. The propensity score weighted hazard ratio for all cause mortality in the cardioversion group was 0.74 (95% confidence interval 0.63 to 0.86) from baseline to one year follow-up and 0.77 (0.64 to 0.93) from one year to two year follow-up. Of the 6595 patients who had cardioversion at baseline, 299 had a follow-up cardioversion more than 48 days after enrolment. 7175 patients were assessed in the analysis comparing type of cardioversion: 2427 (33.8%) received pharmacological cardioversion and 4748 (66.2%) had direct current cardioversion. During one year follow-up, event rates (per 100 patient years) for all cause mortality in patients who received direct current and pharmacological cardioversion were 1.36 (1.13 to 1.64) and 1.70 (1.35 to 2.14), respectively.

**CONCLUSION**

In this large dataset of patients with recent onset non-valvular atrial fibrillation, a small proportion were treated with cardioversion. Direct current cardioversion was performed twice as often as pharmacological cardioversion, and there appeared to be no major difference in outcome events for these two cardioversion modalities. For the overall cardioversion group, after adjustments for confounders, a significantly lower risk of mortality was found in patients who received early cardioversion compared with those who did not receive early cardioversion.

**STUDY REGISTRATION**

ClinicalTrials.gov NCT01090362.

**WHAT IS ALREADY KNOWN ON THIS TOPIC**

For decades direct comparisons of rhythm control and rate control strategies in patients with atrial fibrillation have favoured rate control

More recent results from real world observations on the effect of rhythm control versus rate control on clinical endpoints (such as strokes and mortality) in patients with new onset atrial fibrillation are inconclusive

**WHAT THIS STUDY ADDS**

A small proportion of patients were treated with cardioversion

Direct current cardioversion was performed twice as often as pharmacological cardioversion, and no major difference in outcome events was found for these two modalities

A lower risk of mortality was observed for patients with newly diagnosed atrial fibrillation who underwent early cardioversion compared with patients who did not have early cardioversion

**Introduction**

After anticoagulation treatment for stroke prevention has been prescribed to appropriate patients (those with increased risk of stroke), there are two main treatment approaches for atrial fibrillation. One approach is to try and restore sinus rhythm, which can be achieved by direct current or pharmacological cardioversion. Rhythm control can potentially relieve symptoms and prevent progression of atrial fibrillation[1] and left atrial remodelling.[2] The other treatment option is to allow atrial fibrillation to continue but to control the ventricular rate (rate control). Several randomised controlled trials have shown that this treatment strategy is non-inferior to rhythm control when considering endpoints such as stroke rates and mortality.[3-9] Previous studies also indicate that rates of hospital admission for rate control are lower than those for rhythm control.[4] Guidelines in Europe and America support both strategies but stress the need





Cardioversion in patients with newly diagnosed non-valvular atrial fibrillation: observational study using prospectively collected registry data

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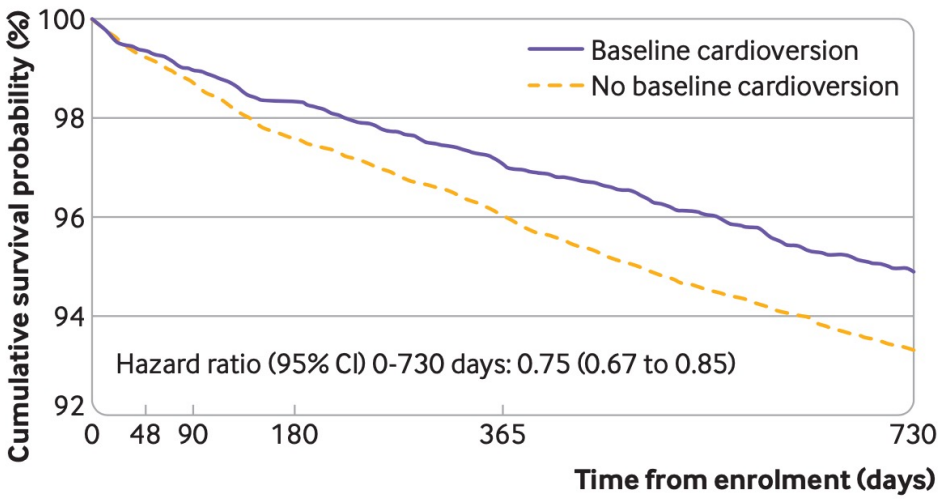


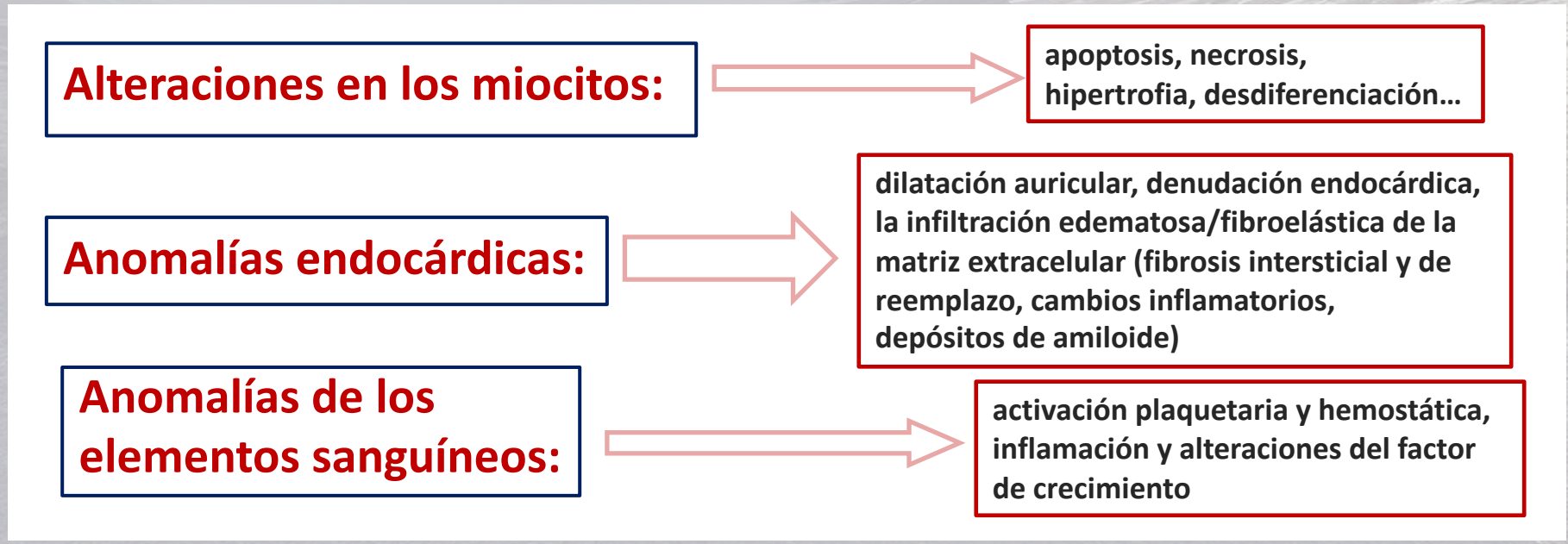

**Fig 3 | Adjusted cumulative survival probabilities by baseline cardioversion and propensity score weighted hazard ratio for baseline cardioversion versus no baseline cardioversion (reference)**

# ¿POR QUÉ ANTICOAGULAR EN CARDIOVERSIÓN?

# ¿POR QUÉ ANTICOAGULAR EN CARDIOVERSIÓN?

## Fisiopatología: mecanismo tromboembólico

- Riesgo de ACV y ES ligado a mecanismos fisiopatológicos subyacentes.
- Proceso lento pero progresivo de remodelado estructural auriculo-ventricular.




ES: embolia Sistémica; ACV: accidente cerebrovascular

# ¿POR QUÉ ANTICOAGULAR EN CARDIOVERSIÓN?

**Alteraciones en los miocitos:** → apoptosis, necrosis, hipertrofia, desdiferenciación…

**Anomalías endocárdicas:** → dilatación auricular, denudación endocárdica, la infiltración edematosa/fibroelástica de la matriz extracelular (fibrosis intersticial y de reemplazo, cambios inflamatorios, depósitos de amiloide)

**Anomalías de los elementos sanguíneos:** → activación plaquetaria y hemostática, inflamación y alteraciones del factor de crecimiento

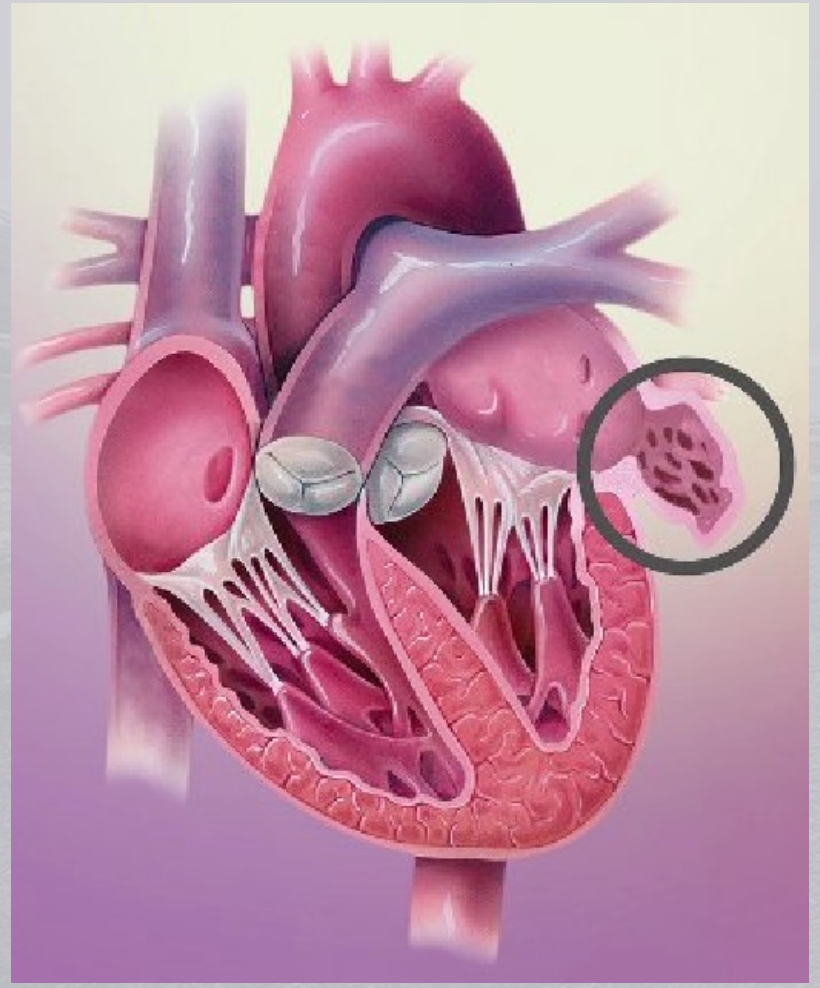
↓

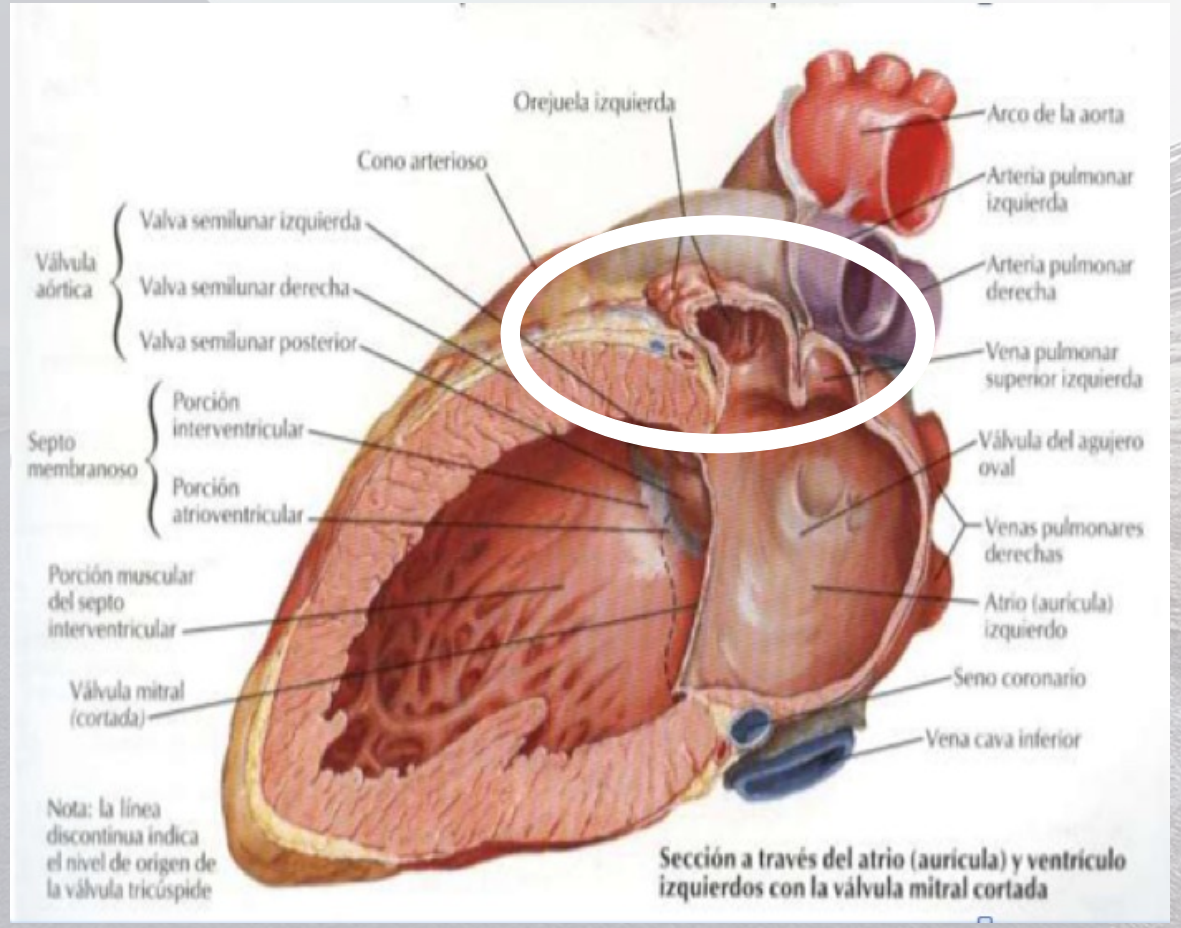
**Anomalías de flujo**
**Estasis dentro de la aurícula izquierda**
**velocidad de flujo reducida en la orejuela izquierda.**

+

**Acortamiento del periodo refractario efectivo auricular en los primeros días de la FA .**
**El remodelado eléctrico.**

- **La orejuela izquierda es la fuente dominante de embolia (> 90%) en la FA no valvular.**





# MORTALIDAD

**MORTALIDAD**

# ¿POR QUÉ ANTICOAGULAR EN CARDIOVERSIÓN?

## Profilaxis en la restauración del ritmo sinusal


**Muy importante conocer el tiempo de evolución de la FA.**

# ¿POR QUÉ ANTICOAGULAR EN CARDIOVERSIÓN?

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doi:10.1093/europace/euu189

CLINICAL RESEARCH
*Atrial fibrillation*

## Thromboembolic risk in 16 274 atrial fibrillation patients undergoing direct current cardioversion with and without oral anticoagulant therapy

**Morten Lock Hansen[1]*, Rikke Malene H.G. Jepsen[2], Jonas Bjerring Olesen[1], Martin Huth Ruwald[1], Deniz Karasoy[1], Gunnar Hilmar Gislason[1], Jim Hansen[1], Lars Køber[3], Steen Husted[4], and Christian Torp-Pedersen[5]**

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*Received 4 February 2014; accepted after revision 12 June 2014; online publish-ahead-of-print 17 September 2014*

**Aims** To study the risk of thromboembolism in a nationwide cohort of atrial fibrillation patients undergoing direct current (DC) cardioversion with or without oral anticoagulant coverage.

**Methods and results** A retrospective study of 16 274 patients in Denmark discharged from hospital after a first-time DC cardioversion for atrial fibrillation between 2000 and 2008. Use of oral anticoagulant therapy within 90 days prior and 360 days after DC cardioversion was obtained from the Danish Register of Medicinal Product Statistics. The risk of thromboembolism was estimated by calculating incidence rates and by multivariable adjusted Cox proportional-hazard models. During the initial 30 days following discharge, the thromboembolic incidence rate was 10.33 per 100 patient-years for the no prior oral anticoagulant therapy group [n = 5084 (31.2%)], as compared with 4.00 per 100 patient-years for the prior oral anticoagulant therapy group [n = 11 190 (68.8%)]. [hazard ratio associated with no prior oral anticoagulant therapy was 2.25; 95% confidence interval (CI), 1.43–3.53]. Thromboembolic risk stratification by the $CHADS_2$ and $CHA_2DS_2$-VASc scores did not change the results. Hazard ratio with no oral anticoagulant therapy was 2.21; 95% CI, 0.79–6.77 and 2.40; 95% CI, 1.46–3.95 with $CHA_2DS_2$-VASc score 0–1 and $CHA_2DS_2$-VASc score 2 or more, respectively.

**Conclusion** Direct current cardioversion for atrial fibrillation without oral anticoagulation is associated with a high risk of thromboembolism. Notably, the risk is high in the initial period after cardioversion, indicating a hazardous association between DC cardioversion without anticoagulation and thromboembolism.

**Keywords** Atrial fibrillation • Oral anticoagulation • Direct current cardioversion • Thromboembolism

### Introduction

Direct current (DC) cardioversion of atrial fibrillation to sinus rhythm carries a risk of systemic embolism.[1–3] In patients with atrial fibrillation lasting for >48 h or with unknown duration, the conventional approach is to provide anticoagulation for 3–4 weeks prior to and for at least 4 weeks after cardioversion.[4] Direct current cardioversion without prolonged oral anticoagulation may be performed in patients with atrial fibrillation duration below 48 h where the risk is considered low or due to acute illness.

In a recent study, the risk of thromboembolic complications was high in certain subgroups of patients when no oral anticoagulation was used after cardioversion of acute atrial fibrillation.[7] Therefore, it is imperative that better estimates of safety are provided for DC cardioversion of atrial fibrillation. In the present study, we examined a nationwide cohort of 16 274 patients undergoing DC cardioversion of atrial fibrillation discharged from hospitals in Denmark between 2000 and 2008. The purpose was to compare the risk of hospitalization or death due to thromboembolism in patients receiving oral

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**Thromboembolic risk in 16 274 atrial fibrillation patients undergoing direct current cardioversion with and without oral anticoagulant therapy**

**Morten Lock Hansen[1]*, Rikke Malene H.G. Jepsen[2], Jonas Bjerring Olesen[1], Martin Huth Ruwald[1], Deniz Karasoy[1], Gunnar Hilmar Gislason[1], Jim Hansen[1], Lars Køber[3], Steen Husted[4], and Christian Torp-Pedersen[5]**

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**Aims** To study the risk of thromboembolism in a nationwide cohort of atrial fibrillation patients undergoing direct current (DC) cardioversion with or without oral anticoagulant coverage.

**Methods and results** A retrospective study of 16 274 patients in Denmark discharged from hospital after a first-time DC cardioversion for atrial fibrillation between 2000 and 2008. Use of oral anticoagulant therapy within 90 days prior and 360 days after DC cardioversion was obtained from the Danish Register of Medicinal Product Statistics. The risk of thromboembolism was estimated by calculating incidence rates and by multivariable adjusted Cox proportional-hazard models. During the initial 30 days following discharge, the thromboembolic incidence rate was 10.33 per 100 patient-years for the no prior oral anticoagulant therapy group [n = 5084 (31.2%)], as compared with 4.00 per 100 patient-years for the prior oral anticoagulant therapy group [n = 11 190 (68.8%)]. [hazard ratio associated with no prior oral anticoagulant therapy was 2.25; 95% confidence interval (CI), 1.43–3.53]. Thromboembolic risk stratification by the $CHADS_2$ and $CHA_2DS_2$-VASc scores did not change the results. Hazard ratio with no oral anticoagulant therapy was 2.21; 95% CI, 0.79–6.77 and 2.40; 95% CI, 1.46–3.95 with $CHA_2DS_2$-VASc score 0–1 and $CHA_2DS_2$-VASc score 2 or more, respectively.

**Conclusion** Direct current cardioversion for atrial fibrillation without oral anticoagulation is associated with a high risk of thromboembolism. Notably, the risk is high in the initial period after cardioversion, indicating a hazardous association between DC cardioversion without anticoagulation and thromboembolism.

**Keywords** Atrial fibrillation • Oral anticoagulation • Direct current cardioversion • Thromboembolism

### Introduction

Direct current (DC) cardioversion of atrial fibrillation to sinus rhythm carries a risk of systemic embolism.[1–3] In patients with atrial fibrillation lasting for >48 h or with unknown duration, the conventional approach is to provide anticoagulation for 3–4 weeks prior to and for at least 4 weeks after cardioversion.[4] Direct current cardioversion without prolonged oral anticoagulation may be performed in patients with atrial fibrillation duration below 48 h where the risk is considered low or due to acute illness.

In a recent study, the risk of thromboembolic complications was high in certain subgroups of patients when no oral anticoagulation was used after cardioversion of acute atrial fibrillation.[7] Therefore, it is imperative that better estimates of safety are provided for DC cardioversion of atrial fibrillation. In the present study, we examined a nationwide cohort of 16 274 patients undergoing DC cardioversion of atrial fibrillation discharged from hospitals in Denmark between 2000 and 2008. The purpose was to compare the risk of hospitalization or death due to thromboembolism in patients receiving oral

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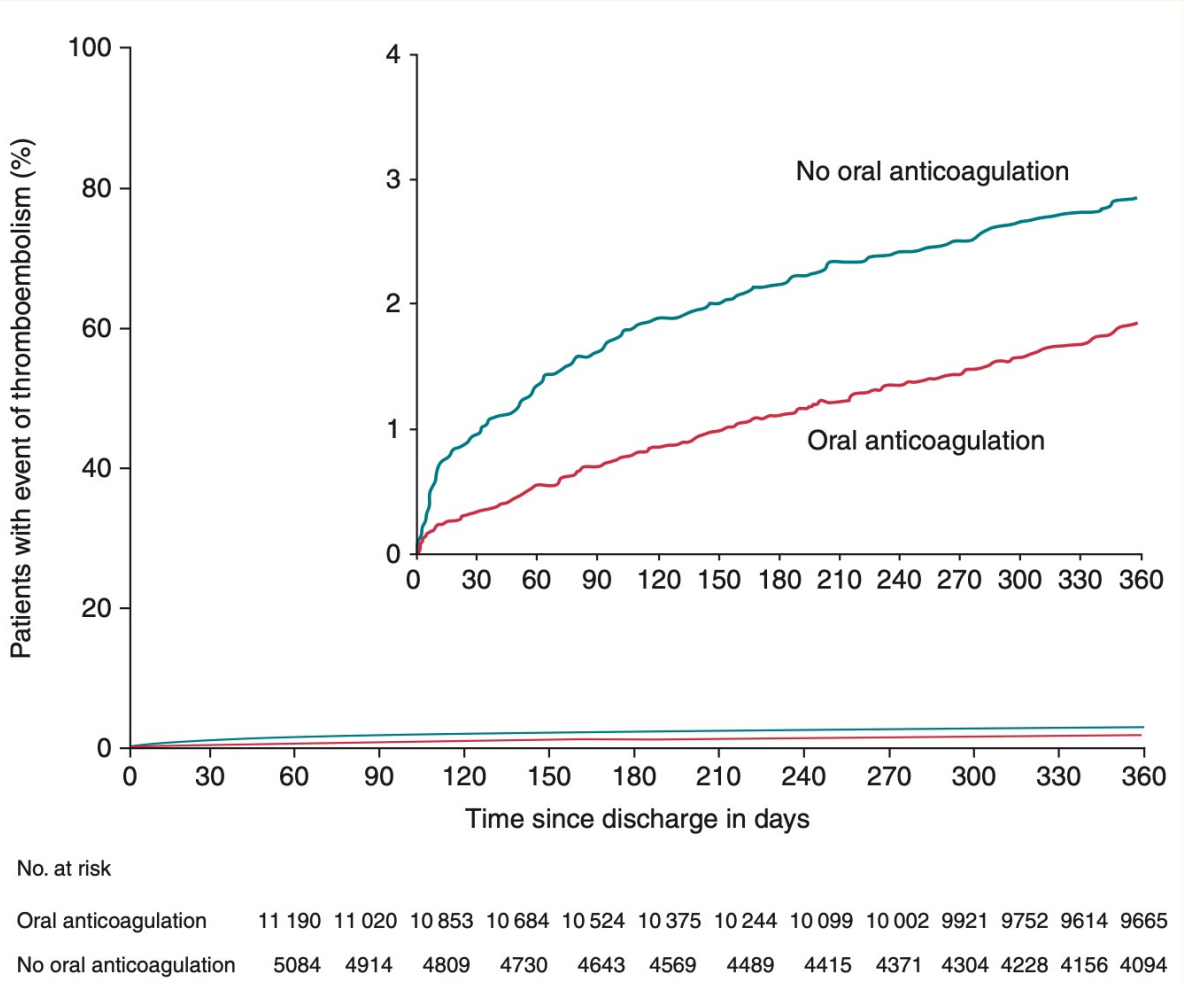


No. at risk

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oral anticoagulation | 11 190 | 11 020 | 10 853 | 10 684 | 10 524 | 10 375 | 10 244 | 10 099 | 10 002 | 9921 | 9752 | 9614 | 9665 |
| No oral anticoagulation | 5084 | 4914 | 4809 | 4730 | 4643 | 4569 | 4489 | 4415 | 4371 | 4304 | 4228 | 4156 | 4094 |

**Figure 1** Kaplan Meijer curves for the outcome of thromboembolism after discharge for DC cardioversion of atrial fibrillation.

# ¿POR QUÉ ANTICOAGULAR EN CARDIOVERSIÓN?



## Anticoagulation, $CHA_2DS_2VASc$ Score, and Thromboembolic Risk of Cardioversion of Acute Atrial Fibrillation (from the FinCV Study)

Toni Grönberg, BM[a], Juha E.K. Hartikainen, MD, PhD[b], Ilpo Nuotio, MD, PhD[c], Fausto Biancari, MD, PhD[d], Antti Ylitalo, MD, PhD[e,f], and K.E. Juhani Airaksinen, MD, PhD[e,*]

**The efficacy of the anticoagulation in preventing thromboembolic complications (TEC) and the usefulness of the $CHA_2DS_2VASc$ score for assessing stroke risk during cardioversion of acute atrial fibrillation (AF) are unclear. Thus, our objectives were to assess the ability of the $CHA_2DS_2VASc$ score to predict TEC and to evaluate the efficacy of anticoagulation in the prevention of TEC in Finnish CardioVersion (FinCV) study. The FinCV is a retrospective, multicenter study of 3,143 patients, who underwent 7,660 cardioversions for acute AF. The value of the $CHA_2DS_2VASc$ score in predicting TEC was analyzed separately in cardioversions performed without and with anticoagulation. A total of 40 definite TEC (0.6%) occurred after 7,237 successful cardioversions and 1 stroke (0.2%) after 423 unsuccessful procedures. In 5,362 cardioversions performed without anticoagulation, the risk of definite TEC increased significantly from 0.4% in patients with a $CHA_2DS_2VASc$ score of 0 to 1 to 2.3% in those with score of ≥5 (p <0.001 for trend). The C-statistic of the $CHA_2DS_2VASc$ score was 0.72 (0.61 to 0.83) in predicting definite TEC in non-anticoagulated patients with first cardioversion. The incidence of definite TEC was significantly lower in 2,298 cardioversions performed during anticoagulation (0.1% vs 0.7%, p = 0.001), and the preventive effect of anticoagulation was significant in patients with a score of ≥2 (0.2% vs 1.1%, p = 0.001). In conclusion, $CHA_2DS_2VASc$ score is a strong predictor of TEC in cardioversion of acute AF performed without anticoagulation. Importantly, periprocedural anticoagulation reduced the risk of TEC by 82%. The overall risk of these complications was low after failed cardioversion.** © 2016 Elsevier Inc. All rights reserved. (Am J Cardiol 2016;117:1294–1298)

The $CHA_2DS_2VASc$ score is the risk stratification scheme in everyday clinical practice to assess the need of anticoagulation in patients with atrial fibrillation (AF),[1] but its value in predicting adverse events in patients who underwent cardioversion of acute AF has not been assessed. Anticoagulation therapy is recommended for patients with acute (duration ≤48 hours) AF and high risk for stroke with no specific $CHA_2DS_2VASc$ score limits,[2,3] but there is limited research data on the efficacy of anticoagulation in this acute setting. Our previous analysis of the Finnish CardioVersion (FinCV) study confirmed the high risk of stroke when cardioversion was performed without adequate periprocedural anticoagulation in patients with conventional stroke risk factors.[4] In the present analysis, we sought to determine whether the $CHA_2DS_2VASc$ score is useful to predict the risk of thromboembolic complications (TEC) after cardioversion of acute AF and whether anticoagulation prevents TEC in high- and low-risk patients. Third, we evaluated whether the $CHA_2DS_2VASc$ score predicts failure of cardioversion, early recurrence of AF, and bradyarrhythmic complications.

### Methods

The FinCV study (ClinicalTrials.gov identifier: NCT01380574) is a multicenter retrospective study including patients who underwent cardioversion for acute AF. The study is a part of wider protocol in progress to assess acute cardiac procedures in Western Finland.[5–7] Study protocol was approved by the Ethics Committees of the Hospital District of Southwest Finland and the National Institutes for Health and Welfare. Patients with a diagnosis of AF at 2 university hospitals from 2003 to 2010 and at 1 central hospital in 2010 were identified from institutional discharge registers by the *International Classification of Diseases, Tenth Revision*, code I48.0. The emergency clinic admission records were reviewed to include all patients with acute AF who underwent cardioversion within 48 hours from symptom onset during the study period. All patient records were reviewed with a standardized data collection protocol, and only patients >18 years and living in the

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See page 1297 for disclosure information.

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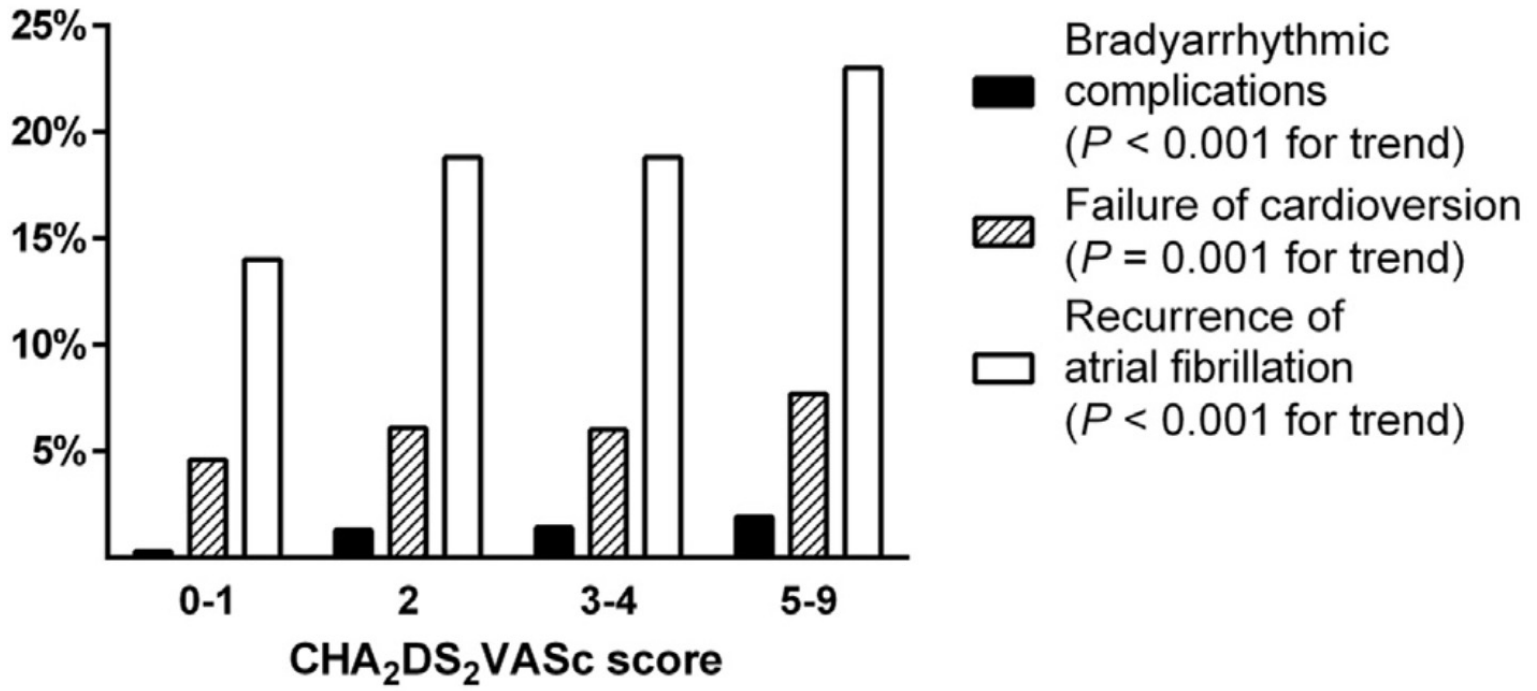


Figure 2. The incidence of secondary end points according to the $CHA_2DS_2VASC$ score. Secondary end points of the study were unsuccessful cardioversion, early recurrence of atrial fibrillation episode after successful cardioversion, and bradyarrhythmic complications after cardioversion. p values calculated using the Cochran-Armitage test for trend.

# ¿CON QUÉ ANTICOAGULAR EN CARDIOVERSIÓN?

# ¿CON QUÉ ANTICOAGULAR EN CARDIOVERSIÓN?

Grupo de ArriTmias SíncoPe SEMESANDALUCÍA

RE-LY | X-VeRT | EMANATE | ENSURE-AF

Arrhythmia/Electrophysiology

## Dabigatran Versus Warfarin in Patients With Atrial Fibrillation

### An Analysis of Patients Undergoing Cardioversion

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***Background***—The Randomized Evaluation of Long-Term Anticoagulation Therapy (RE-LY) trial compared dabigatran 110 mg BID (D110) and 150 mg BID (D150) with warfarin for stroke prevention in 18 113 patients with nonvalvular atrial fibrillation.

***Methods and Results***—Cardioversion on randomized treatment was permitted. Precardioversion transesophageal echocardiography was encouraged, particularly in dabigatran-assigned patients. Data from before, during, and 30 days after cardioversion were analyzed. A total of 1983 cardioversions were performed in 1270 patients: 647, 672, and 664 in the D110, D150, and warfarin groups, respectively. For D110, D150, and warfarin, transesophageal echocardiography was performed before 25.5%, 24.1%, and 13.3% of cardioversions, of which 1.8%, 1.2%, and 1.1% were positive for left atrial thrombi. Continuous treatment with study drug for ≥3 weeks before cardioversion was lower in D110 (76.4%) and D150 (79.2%) compared with warfarin (85.5%; $P<0.01$ for both). Stroke and systemic embolism rates at 30 days were 0.8%, 0.3%, and 0.6% (D110 versus warfarin, $P=0.71$; D150 versus warfarin, $P=0.40$) and similar in patients with and without transesophageal echocardiography. Major bleeding rates were 1.7%, 0.6%, and 0.6% (D110 versus warfarin, $P=0.06$; D150 versus warfarin, $P=0.99$).

***Conclusions***—This study is the largest cardioversion experience to date and the first to evaluate a novel anticoagulant in this setting. The frequencies of stroke and major bleeding within 30 days of cardioversion on the 2 doses of dabigatran were low and comparable to those on warfarin with or without transesophageal echocardiography guidance. Dabigatran is a reasonable alternative to warfarin in patients requiring cardioversion.

***Clinical Trial Registration***—URL: http://www.ClinicalTrials.gov. Unique identifier: NCT00262600.

**(*Circulation*. 2011;123:131-136.)**

**Key Words:** anticoagulants ■ arrhythmia ■ atrial fibrillation ■ cardioversion ■ stroke prevention

Cardioversion (both electric and pharmacological) in patients with atrial fibrillation is associated with an increased risk of thromboembolic events.[1–3] Risk is higher (5% to 7%) if anticoagulation is inadequate.[4,5] With adequate anticoagulation, the risk of thromboembolic events is much lower (0.7% to 0.8%).[6] For patients with atrial fibrillation of >48 hours duration, the current recommendation is therapeutic anticoagulation for at least 3 weeks before and 4 weeks after cardioversion.[7,8]

**Clinical Perspective on p 136**

Warfarin is currently the only US Food and Drug Administration–approved oral anticoagulant for the treatment of atrial fibrillation. Dabigatran is a novel oral anticoagulant that is a potent, competitive, and reversible direct thrombin inhibitor. It has a rapid onset of action, with peak plasma concentration occurring 0.5 to 2 hours after administration, and a half-life of 12 to 17 hours.[9,10] The Randomized Evaluation of Long-Term Anticoagulation Therapy (RE-LY) trial was a multicenter, prospective, randomized, noninferiority trial that compared dabigatran 110 mg BID (D110) and 150 mg BID (D150) administered in a blinded manner with open-label warfarin for stroke prevention in 18 113 patients with nonvalvular atrial fibrillation.[11,12] D110 was similar to and D150 was superior to warfarin for the prevention of

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**FASTTRACK**
**ESC HOT LINE BARCELONA**

## Rivaroxaban vs. vitamin K antagonists for cardioversion in atrial fibrillation

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|---|---|
| **Aims** | X-VeRT is the first prospective randomized trial of a novel oral anticoagulant in patients with atrial fibrillation undergoing elective cardioversion. |
| **Methods and results** | We assigned 1504 patients to rivaroxaban (20 mg once daily, 15 mg if creatinine clearance was between 30 and 49 mL/min) or dose-adjusted vitamin K antagonists (VKAs) in a 2:1 ratio. Investigators selected either an early (target period of 1–5 days after randomization) or delayed (3–8 weeks) cardioversion strategy. The primary efficacy outcome was the composite of stroke, transient ischaemic attack, peripheral embolism, myocardial infarction, and cardiovascular death. The primary safety outcome was major bleeding. The primary efficacy outcome occurred in 5 (two strokes) of 978 patients (0.51%) in the rivaroxaban group and in 5 (two strokes) of 492 patients (1.02%) in the VKA group [risk ratio 0.50; 95% confidence interval (CI) 0.15–1.73]. In the rivaroxaban group, four patients experienced primary efficacy events following early cardioversion (0.71%) and one following delayed cardioversion (0.24%). In the VKA group, three patients had primary efficacy events following early cardioversion (1.08%) and two following delayed cardioversion (0.93%). Rivaroxaban was associated with a significantly shorter time to cardioversion compared with VKAs ($P<0.001$). Major bleeding occurred in six patients (0.6%) in the rivaroxaban group and four patients (0.8%) in the VKA group (risk ratio 0.76; 95% CI 0.21–2.67). |
| **Conclusion** | Oral rivaroxaban appears to be an effective and safe alternative to VKAs and may allow prompt cardioversion. |
| **Name of the trial registry** | Clinicaltrials.gov; Trial registration number: NCT01674647. |
| **Keywords** | Cardioversion • Oral anticoagulant • Stroke • Thromboembolism |

### Introduction

Atrial fibrillation (AF) is the most frequently encountered sustained cardiac arrhythmia, with a prevalence of about 1% in the general population.[1] In symptomatic patients, pharmacological or electrical cardioversion can be used to rapidly restore sinus rhythm.[1] However, there is a peri-procedural risk of thromboembolic events associated with cardioversion, with stroke rates between

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† Co-principal Investigators have contributed equally to this study.



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**FASTTRACK CLINICAL RESEARCH**
*Atrial fibrillation*

## Apixaban compared to heparin/vitamin K antagonist in patients with atrial fibrillation scheduled for cardioversion: the EMANATE trial

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**See page 2972 for the editorial comment on this article (doi: 10.1093/eurheartj/ehy303)**

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|---|---|
| **Aim** | The primary objective was to compare apixaban to heparin/vitamin K antagonist (VKA) in patients with atrial fibrillation (AF) and ≤48 h anticoagulation prior to randomization undergoing cardioversion. |
| **Methods** | One thousand five hundred patients were randomized. The apixaban dose of 5 mg b.i.d. was reduced to 2.5 mg b.i.d. in patients with two of the following: age ≥ 80 years, weight ≤ 60 kg, or serum creatinine ≥ 133 μmol/L. To expedite cardioversion, at the discretion of the investigator, imaging and/or a loading dose of 10 mg (down-titrated to 5 mg) was allowed. The endpoints for efficacy were stroke, systemic embolism (SE), and death. The endpoints for safety were major bleeding and clinically relevant non-major (CRNM) bleeding. |
| **Results** | There were 1038 active and 300 spontaneous cardioversions; 162 patients were not cardioverted. Imaging was performed in 855 patients, and 342 received a loading dose of apixaban. Comparing apixaban to heparin/VKA in the full analysis set, there were 0/753 vs. 6/747 strokes [relative risk (RR) 0; 95% confidence interval (95% CI) 0–0.64; nominal $P=0.015$], no SE, and 2 vs. 1 deaths (RR 1.98; 95% CI 0.19–54.00; nominal $P>0.999$). In the safety population, there were 3/735 vs. 6/721 major (RR 0.49; 95% CI 0.10–2.07; nominal $P=0.338$) and 11 vs. 13 CRNM bleeding events (RR 0.83; 95% CI 0.34–1.89; nominal $P=0.685$). On imaging, 60/61 with thrombi continued randomized treatment; all (61) were without outcome events. |
| **Conclusions** | Rates of strokes, systemic emboli, deaths, and bleeds were low for both apixaban and heparin/VKA treated AF patients undergoing cardioversion. |
| **Clinical Trials.gov number** | NCT02100228 |
| **Keywords** | Apixaban • Heparin/vitamin K antagonist • Cardioversion • Atrial fibrillation • Stroke • Anticoagulation • Cardiac imaging |

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## Edoxaban versus enoxaparin–warfarin in patients undergoing cardioversion of atrial fibrillation (ENSURE-AF): a randomised, open-label, phase 3b trial

*Andreas Goette*, Jose L Merino, Michael D Ezekowitz, Dmitry Zamoryakhin, Michael Melino, James Jin, Michele F Mercuri, Michael A Grosso, Victor Fernandez, Naab Al-Saady, Natalya Pelekh, Bela Merkely, Sergey Zenin, Mykola Kushnir, Jindrich Spinar, Valeriy Batushkin, Joris R de Groot, Gregory Y H Lip*, on behalf of the ENSURE-AF investigators†*

**Summary**

**Background** **Edoxaban, an oral factor Xa inhibitor, is non-inferior for prevention of stroke and systemic embolism in patients with atrial fibrillation and is associated with less bleeding than well controlled warfarin therapy. Few safety data about edoxaban in patients undergoing electrical cardioversion are available.**

**Methods** **We did a multicentre, prospective, randomised, open-label, blinded-endpoint evaluation trial in 19 countries with 239 sites comparing edoxaban 60 mg per day with enoxaparin–warfarin in patients undergoing electrical cardioversion of non-valvular atrial fibrillation. The dose of edoxaban was reduced to 30 mg per day if one or more factors (creatinine clearance 15–50 mL/min, low bodyweight [≤60 kg], or concomitant use of P-glycoprotein inhibitors) were present. Block randomisation (block size four)—stratified by cardioversion approach (transoesophageal echocardiography [TEE] or not), anticoagulant experience, selected edoxaban dose, and region—was done through a voice-web system. The primary efficacy endpoint was a composite of stroke, systemic embolic event, myocardial infarction, and cardiovascular mortality, analysed by intention to treat. The primary safety endpoint was major and clinically relevant non-major (CRNM) bleeding in patients who received at least one dose of study drug. Follow-up was 28 days on study drug after cardioversion plus 30 days to assess safety. This trial is registered with ClinicalTrials.gov, number NCT02072434.**

**Findings** **Between March 25, 2014, and Oct 28, 2015, 2199 patients were enrolled and randomly assigned to receive edoxaban (n=1095) or enoxaparin–warfarin (n=1104). The mean age was 64 years (SD 10·54) and mean CHA$_2$DS$_2$-VASc score was 2·6 (SD 1·4). Mean time in therapeutic range on warfarin was 70·8% (SD 27·4). The primary efficacy endpoint occurred in five (<1%) patients in the edoxaban group versus 11 (1%) in the enoxaparin–warfarin group (odds ratio [OR] 0·46, 95% CI 0·12–1·43). The primary safety endpoint occurred in 16 (1%) of 1067 patients given edoxaban versus 11 (1%) of 1082 patients given enoxaparin–warfarin (OR 1·48, 95% CI 0·64–3·55). The results were independent of the TEE-guided strategy and anticoagulation status.**

**Interpretation** **ENSURE-AF is the largest prospective randomised clinical trial of anticoagulation for cardioversion of patients with non-valvular atrial fibrillation. Rates of major and CRNM bleeding and thromboembolism were low in the two treatment groups.**

**Funding** **Daiichi Sankyo provided financial support for the study.**

### Introduction

Restoration of sinus rhythm in patients with atrial fibrillation is often performed to reduce symptoms. Rhythm control can be achieved by electrical cardioversion, by antiarrhythmic drugs (so-called pharmacological cardioversion), or by both antiarrhythmic drugs and electrical cardioversion.

Cardioversion confers a risk of thromboembolism peri-cardioversion and current guidelines recommend a minimum of 3 weeks of therapeutic anticoagulation (whether oral or parenteral) before elective cardioversion, and continuation of anticoagulation for a minimum of 4 weeks after cardioversion (and longer in patients at risk of atrial fibrillation recurrence or if stroke risk factors are present).[1,2] Cardioversion can be guided by transoesophageal echocardiography (TEE) to exclude left atrial appendage thrombi, which, if present, contraindicate cardioversion.

Vitamin K antagonists (eg, warfarin) have traditionally been used as oral anticoagulation for cardioversion, but vitamin K antagonists have various limitations with substantial interpatient and intrapatient variability, requiring regular monitoring to ensure therapeutic anticoagulation within a target international normalised ratio (INR) range of 2·0–3·0.[3] The difficulties of managing vitamin K antagonists led to variable time to achieve the therapeutic range. In some cases the time to achieve the therapeutic range can be prolonged, hence delaying the cardioversion procedure for a minimum of 3 weeks of therapeutic anticoagulation before elective cardioversion. This delay is particularly relevant in medical care settings with no access to TEE, and heparin bridging is sometimes

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See Comment page 1958

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# ¿CON QUÉ ANTICOAGULAR EN CARDIOVERSIÓN?

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## Direct oral anti-coagulants compared to vitamin-K antagonists in cardioversion of atrial fibrillation: an updated meta-analysis

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**Abstract**
Pharmacological or electrical cardioversion allows immediate symptoms improvement in the setting of paroxysmal or persistent atrial fibrillation (AF), although the periprocedural risk of systemic embolism should be considered. Recently, there was a great interest on the safety and efficacy of direct oral anticoagulants (DOACs) when used for the cardioversion of non-valvular AF. We performed a random-effects meta-analysis of patients undergoing both electrical and pharmacologic cardioversion for non-valvular AF in the RE-LY, ROCKET-AF, ARISTOTLE, ENGAGE AF-TIMI 48, X-VeRT, ENSURE-AF, and EMANATE trials. We assessed Mantel–Haenszel pooled estimates of risk ratios (RRs) and 95% confidence intervals (CIs) for stroke/systemic embolism (SSE) and major bleeding (MB) at follow-up. A total of 8564 patients have been included in the analysis. When compared with patients receiving vitamin-K antagonists (VKAs), patients receiving DOACs had a lower risk of SSE (RR 0.70, 95% CI 0.33–1.546, P = 0.34), as well as of MB (RR 0.86; 95% CI 0.47–1.58, P = 0.62), although both were non-significant. Funnel plot analysis showed, however, lower RRs with more recent ad hoc studies in comparison with registrational studies, even though statistical significance was not reached. DOACs are as effective and as safe as VKAs for thromboembolic prevention in non-valvular AF in the setting of cardioversion. There are differences, although non-significant, between registrational studies and studies enrolling exclusively patients undergoing cardioversion of AF.

**Keywords** Cardioversion · Major bleeding · Meta-analysis · Non-valvular atrial fibrillation · Stroke · Systemic embolism · Warfarin

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### Introduction

Pharmacological or electrical cardioversion improves quality of life in patients affected by paroxysmal or persistent atrial fibrillation (AF) [1]; however, cardioversion may carry a non-negligible burden of cardiovascular complications. An appropriate anticoagulation is therefore required to reduce the risk of stroke/systemic embolism (SSE), which remains high even in the following weeks after cardioversion, despite heart rhythm normalization [2]. Current American and European guidelines therefore recommend the continuation of anticoagulant therapy for at least 4 weeks after cardioversion (either pharmacological or electrical) in patients with AF lasting > 48 h or of unknown onset, independently of the CHA2D2-VASc [3, 4].

The non-vitamin K antagonist oral anticoagulants, also known as direct oral anticoagulants (DOACs) represent a breakthrough in the management of chronic thromboembolic prophylaxis, because of their fixed daily dosage, no



44.- Brunetti, ND; et al. Direct oral anticoagulants compared to vitamin-K antagonists in cardioversión of atrial fibrillation: an udated meta-analysis. Journal of Thrombosis and Thrombolysis. 2018. 45:550-556.

# ¿CON QUÉ ANTICOAGULAR EN CARDIOVERSIÓN?

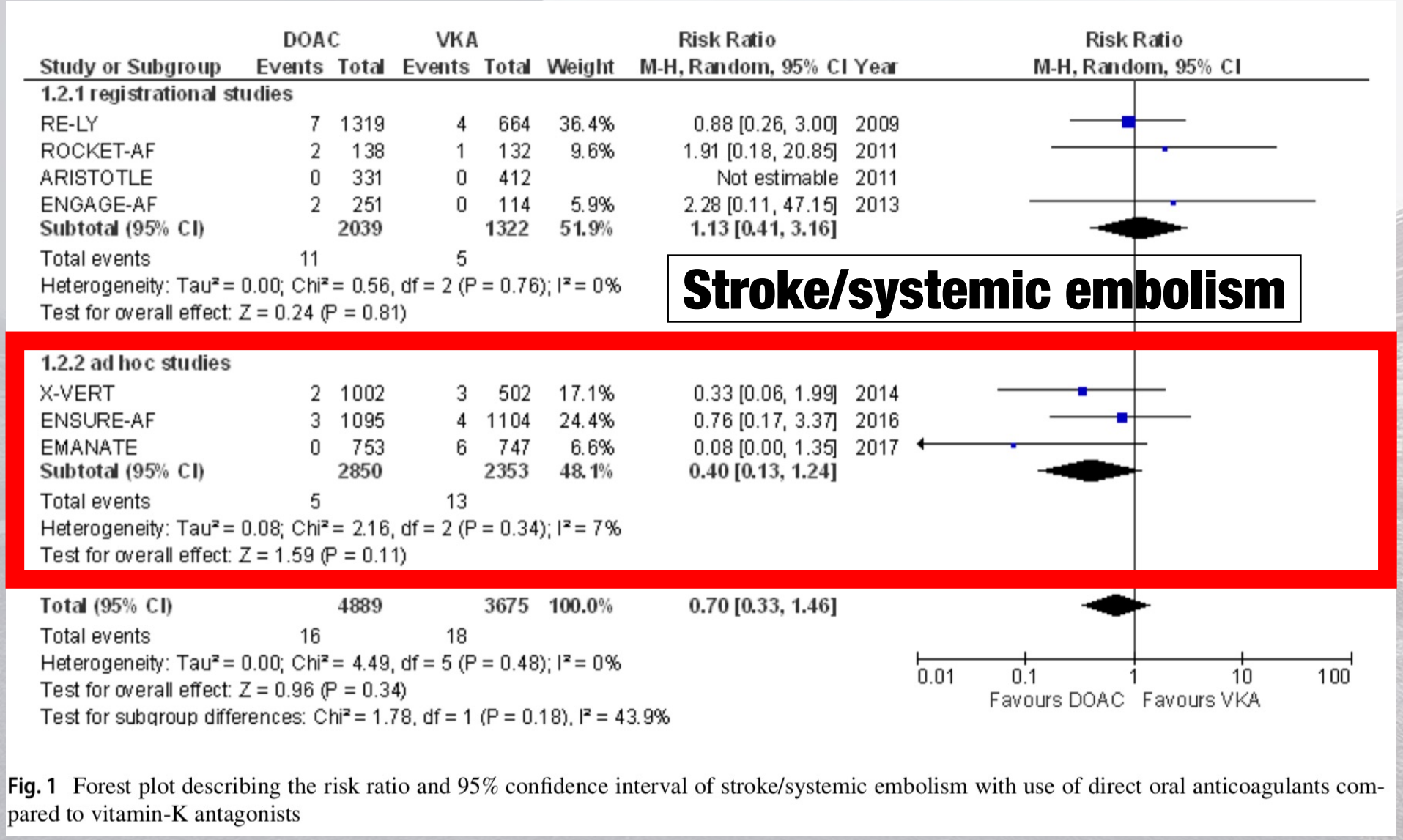



**Fig. 1** Forest plot describing the risk ratio and 95% confidence interval of stroke/systemic embolism with use of direct oral anticoagulants compared to vitamin-K antagonists

# ¿CON QUÉ ANTICOAGULAR EN CARDIOVERSIÓN?

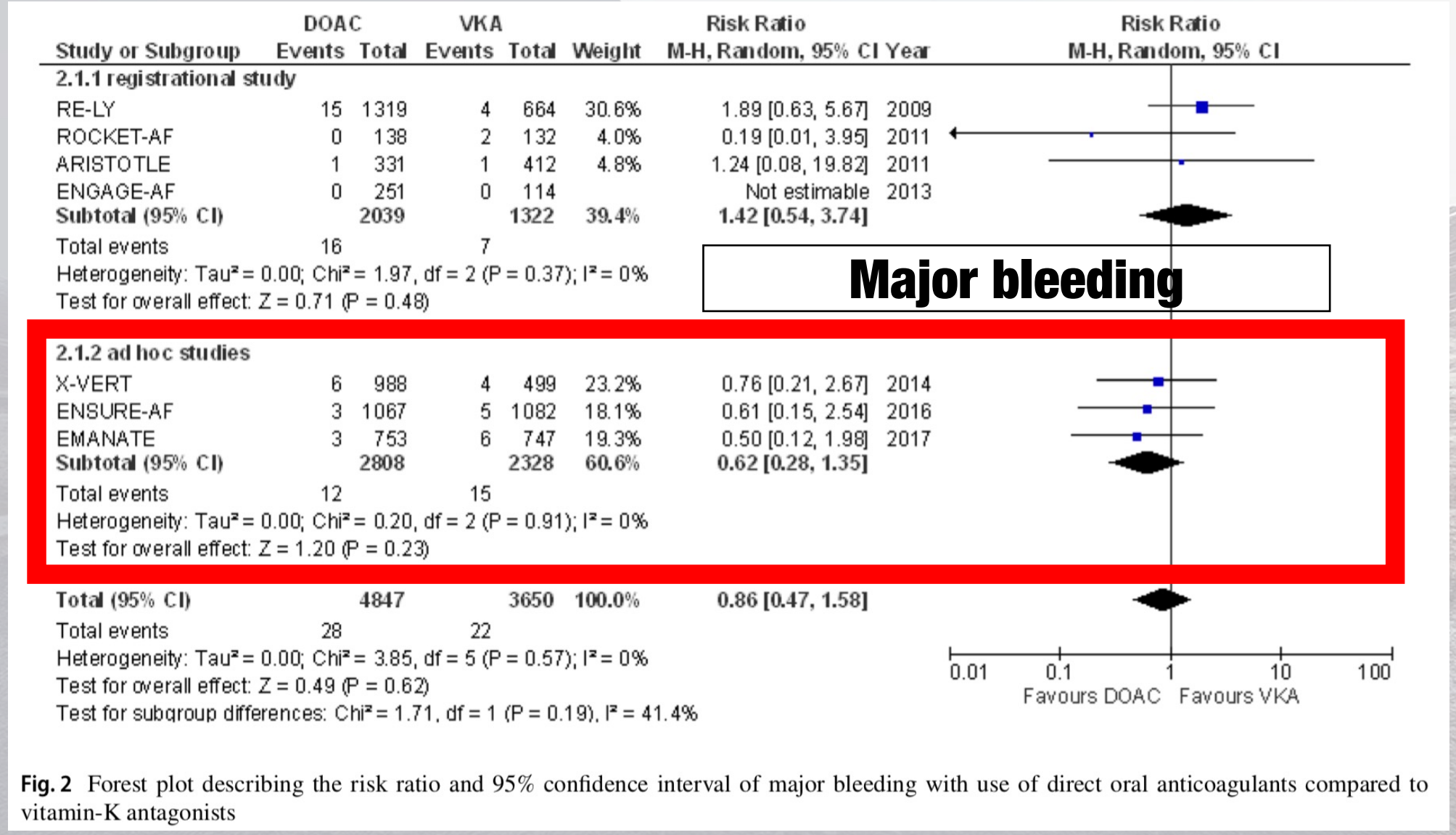
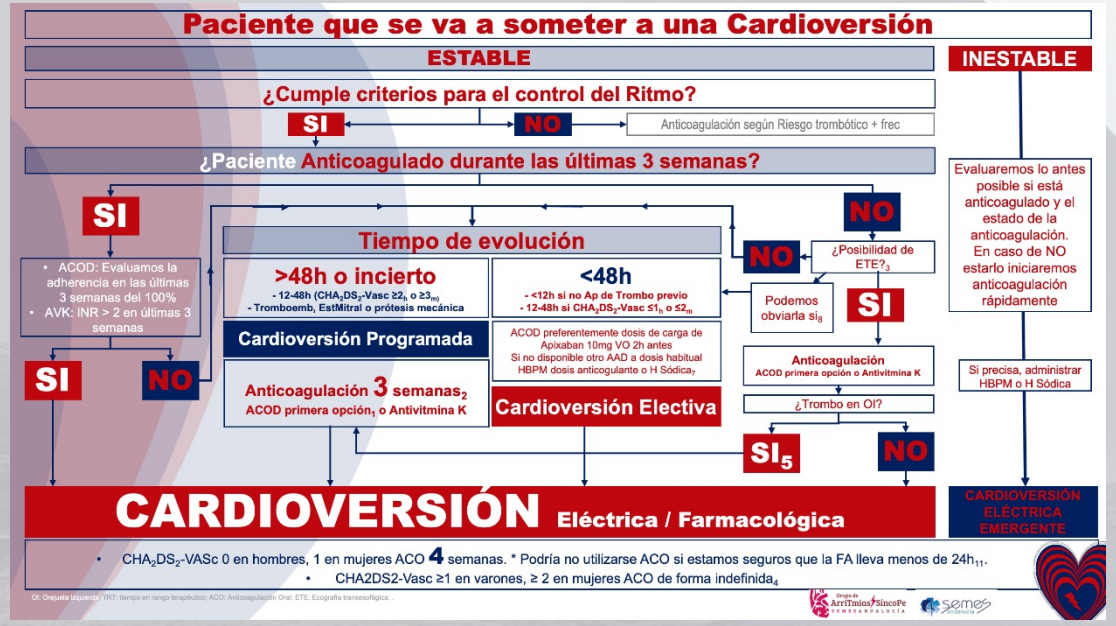



**Fig. 2** Forest plot describing the risk ratio and 95% confidence interval of major bleeding with use of direct oral anticoagulants compared to vitamin-K antagonists

Brunetti, ND; et al. Direct oral anticoagulants compared to vitamin-K antagonists in cardioversión of atrial fibrillation: an udated meta-analysis. Journal of Thrombosis and Thrombolysis. 2018. 45:550-556.

# POSICIONAMIENTO SEMES ANDALUCÍA




**INDICACIONES SEGÚN Informe de Posicionamiento Terapéutico del Sistema Nacional de Salud:**

Para realizar una indicación financiada de un anticoagulante de acción directa en el Sistema sanitario Español se deben cumplir los siguientes criterios:

Puntuación **$CHA_2DS_2$-Vasc ≥2** y al menos una de las siguientes situaciones:

- Alergia o hipersensibilidad demostrada a cumarínicos, reacciones adversas graves asociadas al tratamiento con antagonistas de la vitamina K (AVK), contraindicaciones específicas para el uso de AVK o presencia de una interacción farmacológica relevante, de difícil control a pesar del ajuste posológico en función del INR [que no haya sido descrita para los anticoagulantes orales directos (ACOD)].
- Antecedentes de hemorragia intracraneal (HIC) (excepto durante la fase aguda)
- Ictus isquémico con criterios de alto riesgo de HIC, definido como HAS-BLED >= 3 y al menos uno de los siguientes criterios clínicos: leucoaraiosis grado III-IV y/o microsangrados corticales múltiples
- Pacientes en tratamiento con AVK que sufren episodios tromboembólicos arteriales graves a pesar de un buen control del INR†
- Pacientes que han iniciado tratamiento con AVK y tienen mal control del INR† (no motivado por falta de adherencia al tratamiento). Especificar Valoración del mal control: _____
- Imposibilidad de acceso al control de INR convencional. Especificar Motivo

## Dosis de Fármacos

### ANTICOAGULANTES acción directa

| DABIGATRÁN (Pradaxa®) | RIVAROXABÁN (Xarelto®) | APIXABAN (Eliquis®) | EDOXABAN (Lixiana®) |
|---|---|---|---|
| **150 mg/12h** | **20 mg/24h** | **5 mg/12h** | **60 mg/24h** |
| **110 mg/12h si alguno:**<br>- ≥ 80 años<br>- Verapamilo<br>- Gastritis, esofagitis, RGE<br>- ACr 30-49ml/min y alto R.Hemorrágico<br>- 75-79 años si Riesgo Embólico bajo y R.Hemorrágico alto | **15 mg/24h si:**<br>-IRenal moderada (ACr 30-49ml/min)<br>- IRenal grave (ACr 15-29ml/min) | **2,5 mg/12h si:**<br>Al menos dos:<br>- Edad ≥ 80 años<br>- Peso ≤ 60 Kg<br>- Creatinina sérica ≥ 1,5mg/dl<br>**DOSIS DE CARGA: 10MG** | **30 mg/24h si:**<br>Un factor:<br>- Acr 15-50mL/min<br>- Peso ≤ 60 Kg<br>- Dronedarona, ciclosporina, eritromicina o ketoconazol |

### ACENOCUMAROL (SINTROM®)

- 2mg/24h + HBPM a dosis según el centro, hasta valoración por hematología (Máximo 3-4 días)
- 1mg cada 24h + HBPM a dosis según el protocolo local, hasta valoración por hematología (en máximo 3-4 días) si >75 años, INR>1,2, Insuficiencia hepática severa, desnutrición, cirugía reciente, enfermedades concomitantes graves, ICC, medicamentos que faciliten el sangrado.

### Heparina de Bajo Peso Molecular/Heparina Sódica

Solo tiene cabida su indicación en inicio de tratamiento anticoagulante con antivitamina K y en cardioversión urgente o inestable en pacientes previamente no anticoagulados o pobremente anticoagulados. DOSIS:
- ENOXAPARINA: 1MG/Kg cada 12h
- HEPARINA SÓDICA: 80UI/kg en bolo o 5000 UI independiente del peso

Desde el punto de vista de SEMES Andalucia se debe indicar en primer lugar siempre que sea posible un Anticoagulante de acción directa (Dabigatrán, Rivaroxabán, Apixabán, Edoxabán). En caso de Cardioversión Urgente debería considerarse la dosis de carga de Apixabán en primer lugar salvo contraindicación.

## Criterios para el control del Ritmo

### ¿Buscamos Ritmo Sinusal?

| NO | SI |
|---|---|
| Alta probabilidad de recurrencia:<br>- duración de la arritmia >2años<br>- Múltiples CV previas o fracaso de fármacos (si no criterios de ablación)<br>- >80 años<br>- Recaída precoz (<1mes)<br>- Valvulopatía mitral<br>- Aurícula izquierda severamente dilatada (>55mm)<br>- Mala tolerancia o elevado riesgo de proarritmia con los fármacos para el mantenimiento del ritmo.<br>- Rechazo del paciente | - Pacientes jóvenes<br>- Primer episodio de FA o corta evolución<br>- Taquimiocardiopatía<br>- Hª previa de FA paroxística<br>- FA 2ª a enfermedad transitoria o corregible.<br>- Difícil control de la frecuencia.<br>- FA que produce sintomatología grave<br>- Elección del paciente<br>- Volumen Auricular izquierdo normal o escasamente aumentado<br>- Ninguna o pocas comorbilidades/patología cardíaca |

## Criterios de Cardioversión Programada

Fibrilación auricular de **más de 48 horas** de duración **≥48h o duración incierta, 12-48h ($CHA_2DS_2$-Vasc ≥$2_h$ o ≥$3_m$, tromboembolismo previo, Estenosis Mitral moderada/grave o prótesis mecánica**
No cumple criterios en contra de control del ritmo
No presenta criterios de cardioversión urgente
No presenta criterios de Ingreso.

## Criterios de Cardioversión Electiva (en el episodio actual)

Fibrilación auricular de **<12h si no Ap de Trombo previo, 12-48h si $CHA_2DS_2$-Vasc ≤$1_h$ o ≤$2_m$** y no antecedentes personales de tromboembilismo previo.
No cumple criterios en contra de control del ritmo
No presenta criterios de cardioversión programada
Inestabilidad hemodinámica

## Recomendaciones sobre el control de ictus antes, durante y después de la cardioversión:

1.- Para pacientes con FA que van a someterse a cardioversión, se recomienda la administración de NACO con un perfil de eficacia y seguridad al menos similar al de la warfarina (IA)
2.- Para la cardioversión de la FA/flutter auricular, se recomienda la anticoagulación efectiva durante un mínimo de 3 semanas antes de la cardioversión (IB)
3.- Se recomienda la ETE para excluir trombos cardiacos como alternativa a la anticoagulación durante las 3 semanas previas al procedimiento cuando se planifica una cardioversión precoz (IB)
4.- Para pacientes con riesgo de ictus, se recomienda mantener el tratamiento anticoagulante a largo plazo después de la cardioversión según las recomendaciones específicas sobre anticoagulación por tiempo indefinido, independientemente del método empleado para la cardioversión, el mantenimiento aparente del ritmo sinusal o la caracterización de la FA como un «episodio diagnosticado por primera vez» (IB)
5.- Para pacientes con trombos identificados por ETE, se recomienda la anticoagulación efectiva durante al menos 3 semanas antes de la cardioversión de la FA (IB)
6.- Se recomienda advertir seriamente a los pacientes sobre la importancia de la adherencia y la continuidad del tratamiento con NACO antes y después de la cardioversión (IC)
7.- Se debe iniciar la anticoagulación efectiva tan pronto sea posible antes de cada cardioversión de la FA o flutter auricular (IIa B)
8.- La cardioversión precoz se puede realizar sin ETE en pacientes con una duración de la FA < 48 h (IIa B)
9.- Para pacientes con una duración de la FA > 24 h que se someten a cardioversión, se debe continuar la anticoagulación terapéutica durante al menos 4 semanas, aunque se haya logrado la cardioversión a ritmo sinusal (la decisión de mantener los ACO a largo plazo está determinada por la presencia de factores de riesgo de ictus) (IIa B)
10. Para pacientes con trombos identificados por ETE, se debe considerar la repetición del estudio ecocardiográfico para confirmar la resolución del trombo antes de la cardioversión (IIa C)
11.- Para pacientes con una duración evidente de la FA ≤ 24 h y riesgo muy bajo de ictus (CHA2DS2-VASc de 0 puntos los varones y 1 punto las mujeres), se podría omitir la anticoagulación durante las 4 semanas posteriores a la cardioversión (IIb C)
12.- Cuando se administre un avk se recomienda un INR de 2-3 con un TRT individual >=70%

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Grupo de ArriTmias SíncoPe SEMESANDALUCÍA

# Paciente que se va a someter a una Cardioversión

## ESTABLE

## ¿Cumple criterios para el control del Ritmo?

**SI** ←→ **NO** → Anticoagulación según Riesgo trombótico + frec

## ¿Paciente Anticoagulado durante las últimas 3 semanas?

**SI**

- ACOD: Evaluamos la adherencia en las últimas 3 semanas del 100%
- AVK: INR > 2 en últimas 3 semanas

**SI** / **NO**

## Tiempo de evolución

**>48h o incierto**
- 12-48h ($CHA_2DS_2$-Vasc ≥$2_h$ o ≥$3_m$)
- Tromboemb, EstMitral o prótesis mecánica

**Cardioversión Programada**

**Anticoagulación 3 semanas$_2$**
**ACOD primera opción$_1$ o Antivitmina K**

**<48h**
- <12h si no Ap de Trombo previo
- 12-48h si $CHA_2DS_2$-Vasc ≤$1_h$ o ≤$2_m$

ACOD preferentemente dosis de carga de Apixaban 10mg VO 2h antes
Si no disponible otro AAD a dosis habitual
HBPM dosis anticogulante o H Sódica$_7$

**Cardioversión Electiva**

**NO**

¿Posibilidad de ETE?$_3$

**NO**

Podemos obviarla si$_8$

**SI**

**Anticoagulación**
**ACOD primera opción o Antivitmina K**

¿Trombo en OI?

**SI$_5$** / **NO**

## INESTABLE

Evaluaremos lo antes posible si está anticoagulado y el estado de la anticoagulación. En caso de NO estarlo iniciaremos anticoagulación rápidamente

Si precisa, administrar HBPM o H Sódica

**CARDIOVERSIÓN ELÉCTRICA EMERGENTE**

# CARDIOVERSIÓN Eléctrica / Farmacológica

- $CHA_2DS_2$-VASc 0 en hombres, 1 en mujeres ACO **4** semanas. * Podría no utilizarse ACO si estamos seguros que la FA lleva menos de $24h_{11}$.
- CHA2DS2-Vasc ≥1 en varones, ≥ 2 en mujeres ACO de forma indefinida$_4$

OI: Orejuela Izquierda; TRT: tiempo en rango terapéutico; ACO: Anticoagulación Oral; ETE: Ecografía transesofágica; .

Grupo de ArriTmias SíncoPe SEMESANDALUCÍA · semes andalucía

# Paciente que se va a someter a una Cardioversión

## ESTABLE

## INESTABLE

Evaluaremos lo antes posible si está anticoagulado y el estado de la anticoagulación. En caso de NO estarlo iniciaremos anticoagulación rápidamente

Si precisa, administrar HBPM o H Sódica

**CARDIOVERSIÓN ELÉCTRICA EMERGENTE**

## ¿Cumple criterios para el control del Ritmo?

**SI**

**NO** → Anticoagulación según Riesgo trombótico + frec

## ¿Paciente Anticoagulado durante las últimas 3 semanas?

**SI**

- ACOD: Evaluamos la adherencia en las últimas 3 semanas del 100%
- AVK: INR > 2 en últimas 3 semanas

**SI**

**NO**

## Tiempo de evolución

**>48h o incierto**

- 12-48h ($CHA_2DS_2$-Vasc ≥$2_h$ o ≥$3_m$)
- Tromboemb, EstMitral o prótesis mecánica

**Cardioversión Programada**

**Anticoagulación 3 semanas$_2$**
**ACOD primera opción$_1$ o Antivitmina K**

**<48h**

- <12h si no Ap de Trombo previo
- 12-48h si $CHA_2DS_2$-Vasc ≤$1_h$ o ≤$2_m$

ACOD preferentemente dosis de carga de Apixaban 10mg VO 2h antes
Si no disponible otro AAD a dosis habitual
HBPM dosis anticogulante o H Sódica$_7$

**Cardioversión Electiva**

**NO**

¿Posibilidad de ETE?$_3$

**NO**

Podemos obviarla si$_8$

**SI**

**Anticoagulación**
**ACOD primera opción o Antivitmina K**

¿Trombo en OI?

**SI$_5$**

**NO**

# CARDIOVERSIÓN Eléctrica / Farmacológica

- $CHA_2DS_2$-VASc 0 en hombres, 1 en mujeres ACO **4** semanas. * Podría no utilizarse ACO si estamos seguros que la FA lleva menos de 24h$_{11}$.
- CHA2DS2-Vasc ≥1 en varones, ≥ 2 en mujeres ACO de forma indefinida$_4$

OI: Orejuela Izquierda; TRT: tiempo en rango terapéutico; ACO: Anticoagulación Oral; ETE: Ecografía transesofágica; .

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# Paciente que se va a someter a una Cardioversión

**ESTABLE**

**INESTABLE**

¿Cumple criterios para el control del Ritmo?

## CRITERIOS DE INESTABILIDAD HEMODINÁMICA

- Hipotensión (TA 90/50)
- Angina grave
- Insuficiencia cardiaca grave
- Mala perfusión periférica
- Disminución del nivel de conciencia
- Acidosis láctica
- Riesgo vital inmediato

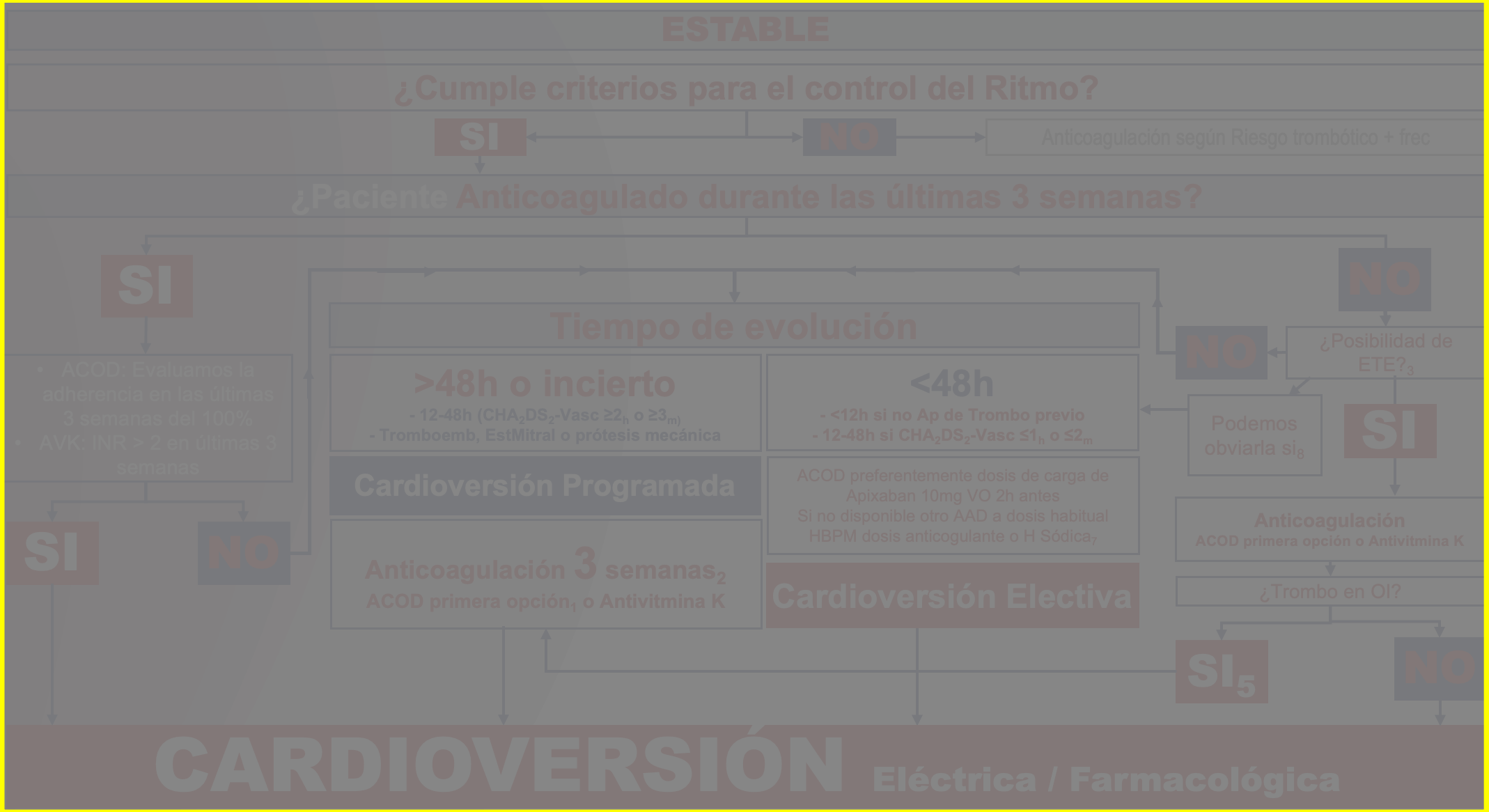
- $CHA_2DS_2$-VASc 0 en hombres, 1 en mujeres ACO **4** semanas. * Podría no utilizarse ACO si estamos seguros que la FA lleva menos de 24h[11].
- CHA2DS2-Vasc ≥1 en varones, ≥ 2 en mujeres ACO de forma indefinida[4]

OI: Orejuela Izquierda; TRT: tiempo en rango terapéutico; ACO: Anticoagulación Oral; ETE: Ecografía transesofágica; .

Grupo de ArriTmias SíncoPe SEMESANDALUCÍA

semes andalucía

# Paciente que se va a someter a una Cardioversión




**INESTABLE**

Evaluaremos lo antes posible si está anticoagulado y el estado de la anticoagulación. En caso de NO estarlo iniciaremos anticoagulación rápidamente

Si precisa, administrar HBPM o H Sódica

**CARDIOVERSIÓN ELÉCTRICA EMERGENTE**

- $CHA_2DS_2$-VASc 0 en hombres, 1 en mujeres ACO **4** semanas. * Podría no utilizarse ACO si estamos seguros que la FA lleva menos de 24h[11].
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OI: Orejuela Izquierda; TRT: tiempo en rango terapéutico; ACO: Anticoagulación Oral; ETE: Ecografía transesofágica; .

# ESTABLE

## ¿Cumple criterios para el control del Ritmo?

**SI**

**NO** → Anticoagulación según Riesgo trombótico + frec

## ¿Paciente Anticoagulado durante las últimas 3 semanas?

**SI**

- ACOD: Evaluamos la adherencia en las últimas 3 semanas del 100%
- AVK: INR > 2 en últimas 3 semanas

**SI** → **Tiempo de evolución**

**NO** → **Anticoagulación 3 semanas$_2$**
**ACOD primera opción$_1$ o Antivitmina K**

**NO**

¿Posibilidad de ETE?$_3$

**NO** → **Tiempo de evolución**

**SI** → Podemos obviarla si$_8$

**Tiempo de evolución**

**>48h o incierto**
- 12-48h ($CHA_2DS_2$-Vasc ≥2$_h$ o ≥3$_m$)
- Tromboemb, EstMitral o prótesis mecánica

**Cardioversión Programada**

**<48h**
- <12h si no Ap de Trombo previo
- 12-48h si $CHA_2DS_2$-Vasc ≤1$_h$ o ≤2$_m$

ACOD preferentemente dosis de carga de Apixaban 10mg VO 2h antes
Si no disponible otro AAD a dosis habitual
HBPM dosis anticogulante o H Sódica$_7$

**Cardioversión Electiva**

**Anticoagulación**
**ACOD primera opción o Antivitmina K**

¿Trombo en OI?

**SI$_5$** → **Cardioversión Electiva**

**NO** → **Cardioversión Programada**

# CARDIOVERSIÓN Eléctrica / Farmacológica

# ESTABLE

## ¿Cumple criterios para el control del Ritmo?

# Criterios para el control del Ritmo

## ¿Buscamos Ritmo Sinusal?

| NO | SI |
|---|---|
| Alta probabilidad de recurrencia:<br>- duración de la arritmia >2años<br>- Múltiples CV previas o fracaso de fármacos (si no criterios de ablación)<br>- >80 años<br>- Recaída precoz (<1mes)<br>- Valvulopatía mitral<br>- Aurícula izquierda severamente dilatada (>55mm)<br>- Mala tolerancia o elevado riesgo de proarritmia con los fármacos para el mantenimiento del ritmo.<br>- Rechazo del paciente | - Pacientes jóvenes<br>- Primer episodio de FA o corta evolución<br>- Taquimiocardiopatía<br>- Hª previa de FA paroxística<br>- FA 2ª a enfermedad transitoria o corregible.<br>- Difícil control de la frecuencia.<br>- FA que produce sintomatología grave<br>- Elección del paciente<br>- Volumen Auricular izquierdo normal o escasamente aumentado<br>- Ninguna o pocas comorbilidades/patología cardíaca |

# ESTABLE

## ¿Cumple criterios para el control del Ritmo?

**SI** → ¿Paciente **Anticoagulado durante las últimas 3 semanas?**

**NO** → Anticoagulación según Riesgo trombótico + frec

### ¿Paciente Anticoagulado durante las últimas 3 semanas?

**SI**

- ACOD: Evaluamos la adherencia en las últimas 3 semanas del 100%
- AVK: INR > 2 en últimas 3 semanas

**SI** → **Tiempo de evolución**

**NO** → **Anticoagulación 3 semanas$_2$**
**ACOD primera opción$_1$ o Antivitmina K**

**NO**

¿Posibilidad de ETE?$_3$

**NO** → Podemos obviarla si$_8$ → **Tiempo de evolución**

**SI** → **Anticoagulación**
**ACOD primera opción o Antivitmina K**

¿Trombo en OI?

**SI$_5$** → **Tiempo de evolución**

**NO** → **CARDIOVERSIÓN Eléctrica / Farmacológica**

### Tiempo de evolución

**>48h o incierto**
- 12-48h ($CHA_2DS_2$-Vasc ≥2$_h$ o ≥3$_m$)
- Tromboemb, EstMitral o prótesis mecánica

→ **Cardioversión Programada**

→ **Anticoagulación 3 semanas$_2$**
**ACOD primera opción$_1$ o Antivitmina K**

**<48h**
- <12h si no Ap de Trombo previo
- 12-48h si $CHA_2DS_2$-Vasc ≤1$_h$ o ≤2$_m$

ACOD preferentemente dosis de carga de Apixaban 10mg VO 2h antes
Si no disponible otro AAD a dosis habitual
HBPM dosis anticogulante o H Sódica$_7$

→ **Cardioversión Electiva**

# CARDIOVERSIÓN Eléctrica / Farmacológica

# ESTABLE

## ¿Cumple criterios para el control del Ritmo?

**SI**

**NO** → Anticoagulación según Riesgo trombótico + frec

## ¿Paciente Anticoagulado durante las últimas 3 semanas?

**SI**

- ACOD: Evaluamos la adherencia en las últimas 3 semanas del 100%
- AVK: INR > 2 en últimas 3 semanas

**SI** → **Tiempo de evolución**

**NO** → Anticoagulación 3 semanas$_2$
ACOD primera opción$_1$ o Antivitmina K

**NO**

¿Posibilidad de ETE?$_3$

**NO** → Podemos obviarla si$_8$

**SI** → **Anticoagulación**
ACOD primera opción o Antivitmina K

¿Trombo en OI?

**SI$_5$** → **Cardioversión Electiva**

**NO**

## Tiempo de evolución

### >48h o incierto
- 12-48h ($CHA_2DS_2$-Vasc ≥2$_h$ o ≥3$_m$)
- Tromboemb, EstMitral o prótesis mecánica

**Cardioversión Programada**

### <48h
- <12h si no Ap de Trombo previo
- 12-48h si $CHA_2DS_2$-Vasc ≤1$_h$ o ≤2$_m$

ACOD preferentemente dosis de carga de Apixaban 10mg VO 2h antes
Si no disponible otro AAD a dosis habitual
HBPM dosis anticogulante o H Sódica$_7$

# CARDIOVERSIÓN Eléctrica / Farmacológica

# ¿Paciente Anticoagulado durante las últimas 3 semanas?

**SI**

- ACOD: Evaluamos la adherencia en las últimas 3 semanas del 100%
- AVK: INR > 2 en últimas 3 semanas

**SI** | **NO**

**NO**

¿Posibilidad de ETE?[3]

**SI**

Podemos obviarla si[8]

## Tiempo de evolución

### >48h o incierto

- 12-48h ($CHA_2DS_2$-Vasc $\geq 2_h$ o $\geq 3_m$)
- Tromboemb, EstMitral o prótesis mecánica

### <48h

- <12h si no Ap de Trombo previo
- 12-48h si $CHA_2DS_2$-Vasc $\leq 1_h$ o $\leq 2_m$

**Cardioversión Programada**

**Anticoagulación 3 semanas[2]**
ACOD primera opción[1] o Antivitmina K

ACOD preferentemente dosis de carga de Apixaban 10mg VO 2h antes
Si no disponible otro AAD a dosis habitual
HBPM dosis anticogulante o H Sódica[7]

**Cardioversión Electiva**

**Anticoagulación**
ACOD primera opción o Antivitmina K

¿Trombo en OI?

**SI[5]** | **NO**

# CARDIOVERSIÓN Eléctrica / Farmacológica

# ¿Paciente Anticoagulado durante las últimas 3 semanas?

**SI**

- ACOD: Evaluamos la adherencia en las últimas 3 semanas del 100%
- AVK: INR > 2 en últimas 3 semanas

**SI**

**NO**

## Tiempo de evolución

### >48h o incierto

- 12-48h ($CHA_2DS_2$-Vasc $\geq 2_h$ o $\geq 3_m$)
- Tromboemb, EstMitral o prótesis mecánica

**Cardioversión Programada**

**Anticoagulación 3 semanas$_2$**
ACOD primera opción$_1$ o Antivitmina K

### <48h

- <12h si no Ap de Trombo previo
- 12-48h si $CHA_2DS_2$-Vasc $\leq 1_h$ o $\leq 2_m$

ACOD preferentemente dosis de carga de Apixaban 10mg VO 2h antes
Si no disponible otro AAD a dosis habitual
HBPM dosis anticogulante o H Sódica$_7$

**Cardioversión Electiva**

**NO**

¿Posibilidad de ETE?$_3$

**NO**

Podemos obviarla si$_8$

**SI**

**Anticoagulación**
ACOD primera opción o Antivitmina K

¿Trombo en OI?

**SI$_5$**

**NO**

# CARDIOVERSIÓN Eléctrica / Farmacológica

# ¿Paciente Anticoagulado durante las últimas 3 semanas?

**SI**

- ACOD: Evaluamos la adherencia en las últimas 3 semanas del 100%
- AVK: INR > 2 en últimas 3 semanas

**SI** | **NO**

**NO**

## Tiempo de evolución

| >48h o incierto | <48h |
|---|---|
| - 12-48h ($CHA_2DS_2$-Vasc $\geq 2_h$ o $\geq 3_m$)<br>- Tromboemb, EstMitral o prótesis mecánica | - <12h si no Ap de Trombo previo<br>- 12-48h si $CHA_2DS_2$-Vasc $\leq 1_h$ o $\leq 2_m$ |
| **Cardioversión Programada** | ACOD preferentemente dosis de carga de Apixaban 10mg VO 2h antes<br>Si no disponible otro AAD a dosis habitual<br>HBPM dosis anticogulante o H Sódica$_7$ |
| **Anticoagulación 3 semanas$_2$**<br>ACOD primera opción$_1$ o Antivitmina K | **Cardioversión Electiva** |

**NO**

¿Posibilidad de ETE?$_3$

Podemos obviarla si$_8$

**SI**

**Anticoagulación**
ACOD primera opción o Antivitmina K

¿Trombo en OI?

**SI$_5$** | **NO**

# CARDIOVERSIÓN Eléctrica / Farmacológica

# Tiempo de evolución

## >48h o incierto

- 12-48h ($CHA_2DS_2$-Vasc $\geq 2_h$ o $\geq 3_m$)
- Tromboemb, EstMitral o prótesis mecánica

## <48h

- <12h si no Ap de Trombo previo
- 12-48h si $CHA_2DS_2$-Vasc $\leq 1_h$ o $\leq 2_m$

## Cardioversión Programada

ACOD preferentemente dosis de carga de
Apixaban 10mg VO 2h antes
Si no disponible otro AAD a dosis habitual
HBPM dosis anticogulante o H Sódica$_7$

## Anticoagulación 3 semanas$_2$

ACOD primera opción$_1$ o Antivitmina K

## Cardioversión Electiva

Rev Esp Cardiol. 2021;74(5):437.e1-437.e1

Guía de Práctica Clínica

# Guía ESC 2020 sobre el diagnóstico y tratamiento de la fibrilación auricular, desarrollada en colaboración de la *European Association for Cardio-Thoracic Surgery* (EACTS)

## Grupo de Trabajo de la Sociedad Europea de Cardiología (ESC) para el diagnóstico y el tratamiento de la fibrilación auricular

## Desarrollada con la colaboración especial de la *European Heart Rhythm Association* (EHRA) de la ESC

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La lista de miembros del Comité de la ESC para la elaboración de Guías de Práctica Clínica y los revisores de las sociedades nacionales se recogen en el anexo.

**Entidades de la ESC que han participado en la elaboración de este documento:**
Asociaciones: *Association for Acute CardioVascular Care* (ACVC), *Association of Cardiovascular Nursing & Allied Professions* (ACNAP), *European Association of Cardiovascular Imaging* (EACVI), *European Association of Preventive Cardiology* (EAPC), *European Association of Percutaneous Cardiovascular Interventions* (EAPCI), *European Heart Rhythm Association* (EHRA) y *Heart Failure Association* (HFA).
Consejos: *Council on Stroke* y *Council on Valvular Heart Disease*.
Grupos de Trabajo: *Cardiac Cellular Electrophysiology, Cardiovascular Pharmacotherapy, Cardiovascular Surgery, e-Cardiology* y *Thrombosis*.



Las declaraciones de conflicto de intereses de los expertos participantes en el desarrollo de esta guía están disponibles en la página web de la ESC: www.escardio.org/guidelines.

El material adicional, que incluye información básica y trata en detalle los datos que sirven de base a esta guía, se encuentra disponible en la página web de *European Heart Journal* y en la página web de la ESC www.escardio.org/guidelines.

*Palabras clave:*
Guías de práctica clínica • Fibrilación auricular • Anticoagulación • Antagonistas de la vitamina K • Anticoagulantes orales no dependientes de la vitamina K • Oclusión de la orejuela izquierda • Control de la frecuencia cardiaca • Control del ritmo cardiaco • Cardioversión • Fármacos antiarrítmicos • Ablación con catéter • Aislamiento de venas pulmonares • Ablación auricular izquierda • Cirugía de la FA • Tratamiento previo • Estrategia ABC • Cribado • Ictus • Recomendaciones

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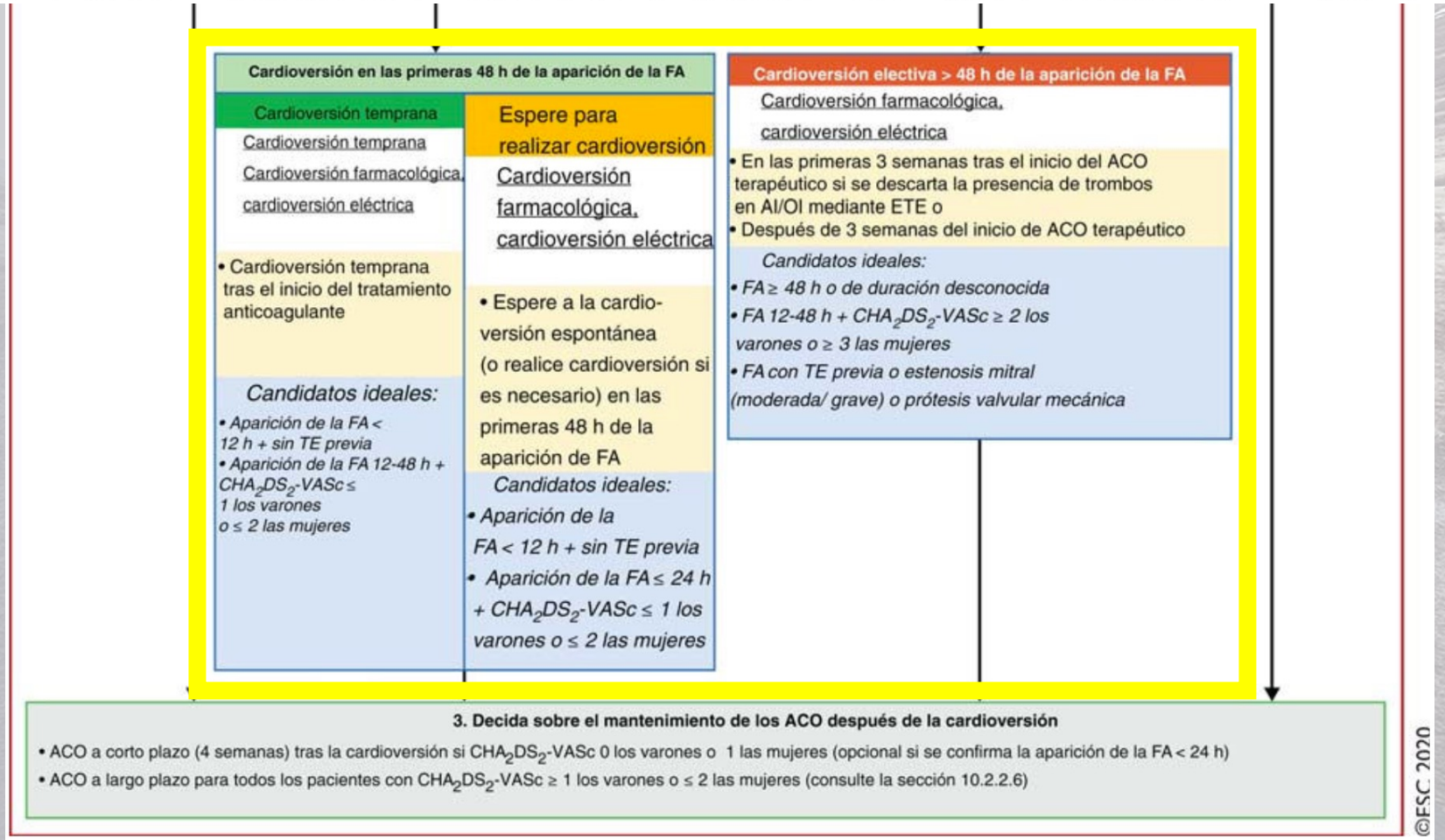
0300-8932/



ESC European Society of Cardiology
Europace (2021) 00, 1–65
doi:10.1093/europace/euab065

POSITION PAPER
EHRA PRACTICAL GUIDE

# 2021 European Heart Rhythm Association Practical Guide on the Use of Non-Vitamin K Antagonist Oral Anticoagulants in Patients with Atrial Fibrillation

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**Keywords** NOACs • DOACs • apixaban • dabigatran • edoxaban • rivaroxaban

## Table of Content



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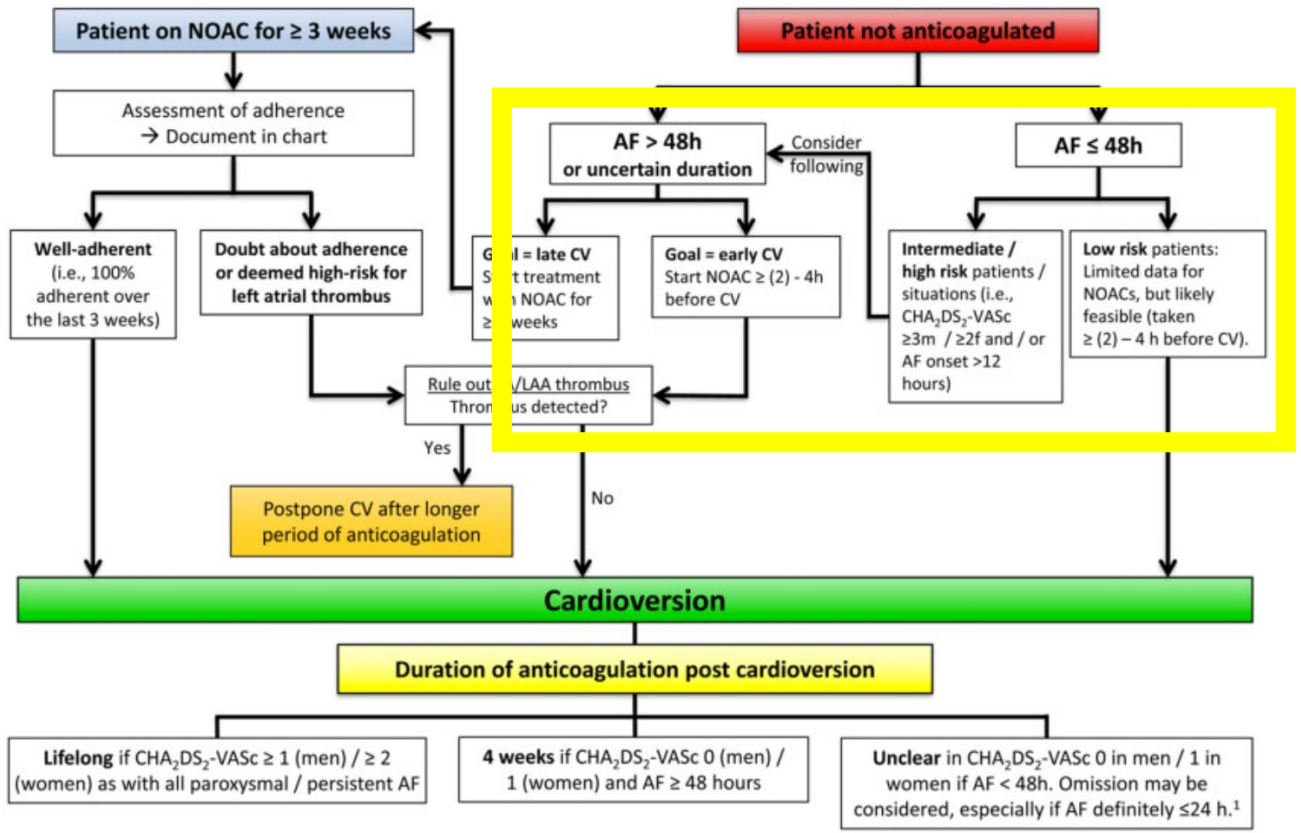



**Figure 19** Cardioversion workflow in AF patients treated with NOAC, depending on the duration of the arrhythmia and prior anticoagulation. AF, atrial fibrillation; CV, cardiovascular; LA, left atrium; LAA, left atrial appendage; NOAC, non-vitamin K antagonist oral anticoagulant.

**>48h o incierto**

- 12-48h ($CHA_2DS_2$-Vasc ≥$2_h$ o ≥$3_m$)
- Tromboemb, EstMitral o prótesis mecánica

**<48h**

- <12h si no Ap de Trombo previo
- 12-48h si $CHA_2DS_2$-Vasc ≤$1_h$ o ≤$2_m$

Grupo de ArriTmias SíncoPe SEMESANDALUCÍA

## Letters

RESEARCH LETTER

### Time to Cardioversion for Acute Atrial Fibrillation and Thromboembolic Complications

In 1995, practice guidelines recommended a limit of 48 hours after the onset of atrial fibrillation (AF) for cardioversion without anticoagulation.[1-3] Whether the risk of thromboembolic complications is increased when cardioversion without anticoagulation is performed in less than 48 hours is unknown.

**Methods** | In the retrospective Finnish CardioVersion study,[4] all patients with a primary diagnosis of AF, aged 18 years or older, with successful cardioversion in the emergency department within the first 48 hours of AF, and residence in the catchment areas of Turku and Kuopio university hospitals from 2003 to 2010 and Pori central hospital during 2010 were included. Clinical details and the occurrence of thromboembolic complications within 30 days after cardioversion were retrospectively collected from medical reports.

The primary outcome, a thromboembolic event, was defined as a clinical stroke or systemic embolism confirmed by computerized tomography or magnetic resonance imaging, surgery, or autopsy. Time to cardioversion was determined as the difference between the beginning of arrhythmic symptoms to the exact time of cardioversion. If the duration of arrhythmia was uncertain, the cardioversion

Table 1. Time to Cardioversion for Acute Atrial Fibrillation and Thromboembolic Complications[a]

| | Total No. of Patients | No. (%) of Patients by Time to Cardioversion[b] <12 h (n = 2440) | 12–<24 h (n = 1840) | 24–<48 h (n = 836) | P Value[c] |
|---|---|---|---|---|---|
| Age, mean (SD), y | 5116 | 61.0 (12.2) | 60.6 (12.7) | 61.7 (12.5) | .04 |
| Female sex | 1638 | 851 (34.9) | 551 (30.0) | 236 (28.2) | <.001 |
| Hypertension | 2324 | 1117 (45.8) | 833 (45.3) | 374 (44.7) | .86 |
| Diabetes | 409 | 207 (8.5) | 129 (7.0) | 73 (8.7) | .15 |
| Vascular disease | 1145 | 555 (22.8) | 407 (22.2) | 183 (21.9) | .83 |
| Heart failure | 184 | 78 (3.2) | 63 (3.4) | 43 (5.1) | .03 |
| History of | | | | | |
| Myocardial infarction | 329 | 171 (7.0) | 104 (5.7) | 54 (6.5) | .20 |
| Thromboembolism | 291 | 142 (5.8) | 106 (5.8) | 43 (5.1) | .76 |
| $CHADS_2$ score[d] | | | | | |
| 0-1 | 4264 | 2039 (47.8) | 1546 (36.3) | 679 (15.9) | |
| 2 | 580 | 265 (45.7) | 202 (34.8) | 113 (19.5) | .25 |
| 3-6 | 272 | 136 (50.0) | 92 (33.8) | 44 (16.2) | |
| $CHA_2DS_2$-VASc score[e] | | | | | |
| 0-1 | 2678 | 1260 (47.1) | 984 (36.7) | 434 (16.2) | |
| 2 | 1030 | 486 (47.2) | 365 (35.4) | 179 (17.4) | |
| 3-5 | 1284 | 634 (49.4) | 446 (34.7) | 204 (15.9) | .80 |
| >5 | 120 | 59 (49.2) | 42 (35.0) | 19 (15.8) | |
| | | No. (%) [95% CI] of Patients by Time to Cardioversion | | | |
| Thromboembolic complications | 38 | 8 (0.3) [0.1-0.6] | 21 (1.1) [0.7-1.6] | 9 (1.1) [0.4-1.8] | .004 |
| By sex | | | | | |
| Female | 22 | 3 (0.4) [0-0.8] | 13 (2.4) [1.1-3.6] | 6 (2.5) [0.5-4.6] | .001 |
| Male | 16 | 5 (0.3) [0-0.6] | 8 (0.6) [0.2-1.0] | 3 (0.5) [0-1.1] | .48 |
| By $CHADS_2$ score | | | | | |
| 0-1 | 25 | 4 (0.2) [0-0.4] | 15 (1.0) [0.5-1.5] | 6 (0.9) [0.2-1.6] | .006 |
| >1 | 13 | 4 (1.0) [0-2.0] | 6 (2.0) [0.4-3.7] | 3 (1.9) [0-4.1] | .50 |
| By $CHA_2DS_2$-VASc score | | | | | |
| 0-1 | 10 | 2 (0.2) [0-0.4] | 4 (0.4) [0-0.8] | 4 (0.9) [0-1.8] | .06 |
| >1 | 28 | 6 (0.5) [0.1-0.9] | 17 (2.0) [1.1-2.9] | 5 (1.2) [0.2-2.3] | .008 |
| By cardioversion | | | | | |
| First | 25 | 5 (0.4) [0.1-0.8] | 12 (1.3) [0.6-2.1] | 8 (2.0) [0.6-3.3] | .01 |
| Subsequent | 13 | 3 (0.2) [0-0.6] | 9 (0.6) [0-1.4] | 1 (0.6) [0-1.9] | .046 |

[a] In the 2481 patients, multiple events (n = 5116) were included in the analyses.
[b] Values expressed as number (percentage) unless otherwise indicated.
[c] Bivariable comparisons between the groups were performed using the $\chi^2$ test, the Fisher exact test, or the Wilcoxon nonparametric test.
[d] Defined as cardiac failure, hypertension, age, diabetes, and stroke (doubled).
[e] Defined as cardiac failure, hypertension, age of 75 years or older (doubled), diabetes, stroke (doubled), vascular disease, age of 65 to 74 years, and female sex.





Table 1. Time to Cardioversion for Acute Atrial Fibrillation and Thromboembolic Complications[a]

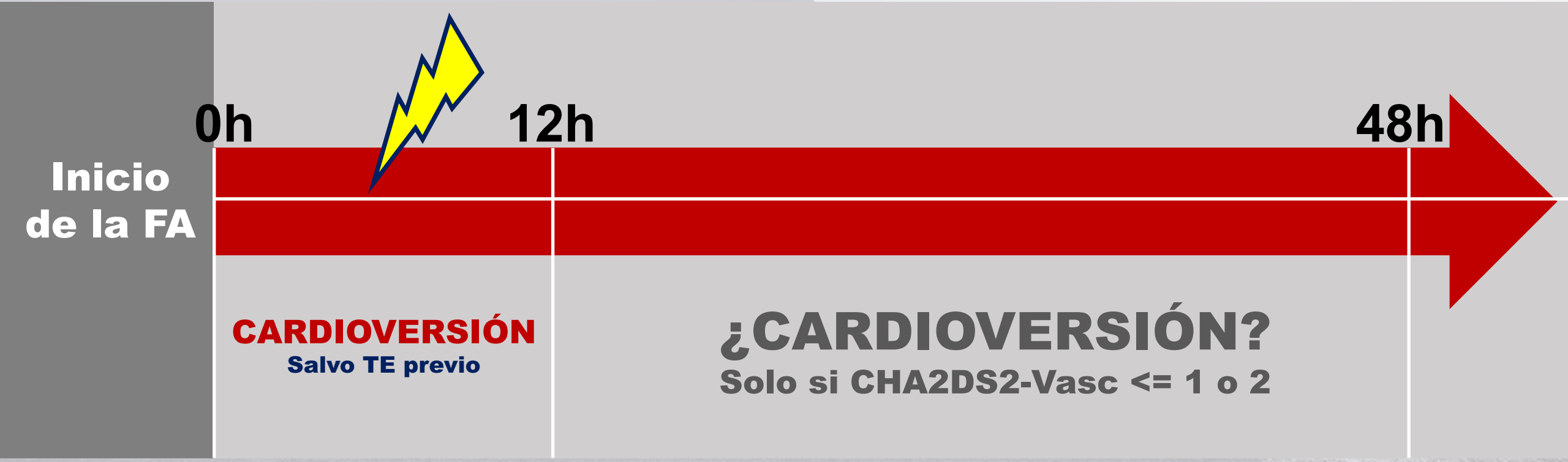
| | Total No. of | No. (%) of Patients by Time to Cardioversion[b] <12 h | 12-<24 h | 24-<48 h | |
|---|---|---|---|---|---|
| By $CHA_2DS_2$-VASc score | | | | | |
| 0-1 | 10 | 2 (0.2) [0-0.4] | 4 (0.4) [0-0.8] | 4 (0.9) [0-1.8] | .06 |
| >1 | 28 | 6 (0.5) [0.1-0.9] | 17 (2.0) [1.1-2.9] | 5 (1.2) [0.2-2.3] | .008 |
| By cardioversion | | | | | |
| First | 25 | 5 (0.4) [0.1-0.8] | 12 (1.3) [0.6-2.1] | 8 (2.0) [0.6-3.3] | .01 |
| Subsequent | 13 | 3 (0.2) [0-0.6] | 9 (0.6) [0-1.4] | 1 (0.6) [0-1.9] | .046 |

## Table 2. Multivariable Analysis of Risk Factors for Thromboembolic Complications (n=5116)

| | Odds Ratio (95% CI)[a] | *P* Value |
|---|---|---|
| Time to cardioversion, h | | |
| 12-24 vs <12 | 4.0 (1.7-9.1) | .001 |
| 24-48 vs <12 | 3.3 (1.3-8.9) | .02 |
| Age, y[b] | 1.06 (1.03-1.09) | <.001 |
| Female sex | 2.1 (1.1-4.3) | .04 |
| Heart failure | 3.5 (1.4-8.6) | <.001 |
| Diabetes | 2.7 (1.3-5.8) | .01 |

[a] Multivariable logistic regression analysis with a repeated-measure model.

[b] Treated as a continuous variable without cut points.


Inicio de la FA
0h
12h
48h
CARDIOVERSIÓN
Salvo TE previo
¿CARDIOVERSIÓN?
Solo si CHA2DS2-Vasc <= 1 o 2

# Paciente que se va a someter a una Cardioversión

## ESTABLE

## ¿Cumple criterios para el control del Ritmo?

**SI** → **NO** → Anticoagulación según Riesgo trombótico + frec

## ¿Paciente Anticoagulado durante las últimas 3 semanas?

**SI**

- ACOD: Evaluamos la adherencia en las últimas 3 semanas del 100%
- AVK: INR > 2 en últimas 3 semanas

**SI** / **NO**

## Tiempo de evolución

**>48h o incierto**
- 12-48h ($CHA_2DS_2$-Vasc $\geq 2_h$ o $\geq 3_m$)
- Tromboemb, EstMitral o prótesis mecánica

**Cardioversión Programada**

**Anticoagulación 3 semanas$_2$**
ACOD primera opción$_1$ o Antivitmina K

**<48h**
- <12h si no Ap de Trombo previo
- 12-48h si $CHA_2DS_2$-Vasc $\leq 1_h$ o $\leq 2_m$

ACOD preferentemente dosis de carga de Apixaban 10mg VO 2h antes
Si no disponible otro AAD a dosis habitual
HBPM dosis anticogulante o H Sódica$_7$

**Cardioversión Electiva**

**NO**

¿Posibilidad de ETE?$_3$

**NO** → Podemos obviarla si$_8$

**SI**

**Anticoagulación**
ACOD primera opción o Antivitmina K

¿Trombo en OI?

**SI$_5$** / **NO**

## INESTABLE

Evaluaremos lo antes posible si está anticoagulado y el estado de la anticoagulación. En caso de NO estarlo iniciaremos anticoagulación rápidamente

Si precisa, administrar HBPM o H Sódica

# CARDIOVERSIÓN Eléctrica / Farmacológica

**CARDIOVERSIÓN ELÉCTRICA EMERGENTE**

- $CHA_2DS_2$-VASc 0 en hombres, 1 en mujeres ACO **4** semanas. * Podría no utilizarse ACO si estamos seguros que la FA lleva menos de 24h$_{11}$.
- CHA2DS2-Vasc ≥1 en varones, ≥ 2 en mujeres ACO de forma indefinida$_4$

OI: Orejuela izquierda, TRT: tiempo en rango terapeutico, ACO: Anticoagulación Oral, ETE: Ecografía transesofágica, .

ArriTmias SíncoPe SEMESANDALUCÍA · semes andalucía

Rev Esp Cardiol. 2021;74(5):437.e1-437.e1

Guía de Práctica Clínica

# Guía ESC 2020 sobre el diagnóstico y tratamiento de la fibrilación auricular, desarrollada en colaboración de la *European Association for Cardio-Thoracic Surgery* (EACTS)

## Grupo de Trabajo de la Sociedad Europea de Cardiología (ESC) para el diagnóstico y el tratamiento de la fibrilación auricular

## Desarrollada con la colaboración especial de la *European Heart Rhythm Association* (EHRA) de la ESC

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La lista de miembros del Comité de la ESC para la elaboración de Guías de Práctica Clínica y los revisores de las sociedades nacionales se recogen en el anexo.

**Entidades de la ESC que han participado en la elaboración de este documento:**
Asociaciones: *Association for Acute CardioVascular Care* (ACVC), *Association of Cardiovascular Nursing & Allied Professions* (ACNAP), *European Association of Cardiovascular Imaging* (EACVI), *European Association of Preventive Cardiology* (EAPC), *European Association of Percutaneous Cardiovascular Interventions* (EAPCI), *European Heart Rhythm Association* (EHRA) y *Heart Failure Association* (HFA).
Consejos: *Council on Stroke* y *Council on Valvular Heart Disease*.
Grupos de Trabajo: *Cardiac Cellular Electrophysiology, Cardiovascular Pharmacotherapy, Cardiovascular Surgery, e-Cardiology* y *Thrombosis*.



Las declaraciones de conflicto de intereses de los expertos participantes en el desarrollo de esta guía están disponibles en la página web de la ESC: www.escardio.org/guidelines.

El material adicional, que incluye información básica y trata en detalle los datos que sirven de base a esta guía, se encuentra disponible en la página web de *European Heart Journal* y en la página web de la ESC www.escardio.org/guidelines.

*Palabras clave:*
Guías de práctica clínica • Fibrilación auricular • Anticoagulación • Antagonistas de la vitamina K • Anticoagulantes orales no dependientes de la vitamina K • Oclusión de la orejuela izquierda • Control de la frecuencia cardiaca • Control del ritmo cardiaco • Cardioversión • Fármacos antiarrítmicos • Ablación con catéter • Aislamiento de venas pulmonares • Ablación auricular izquierda • Cirugía de la FA • Tratamiento previo • Estrategia ABC • Cribado • Ictus • Recomendaciones

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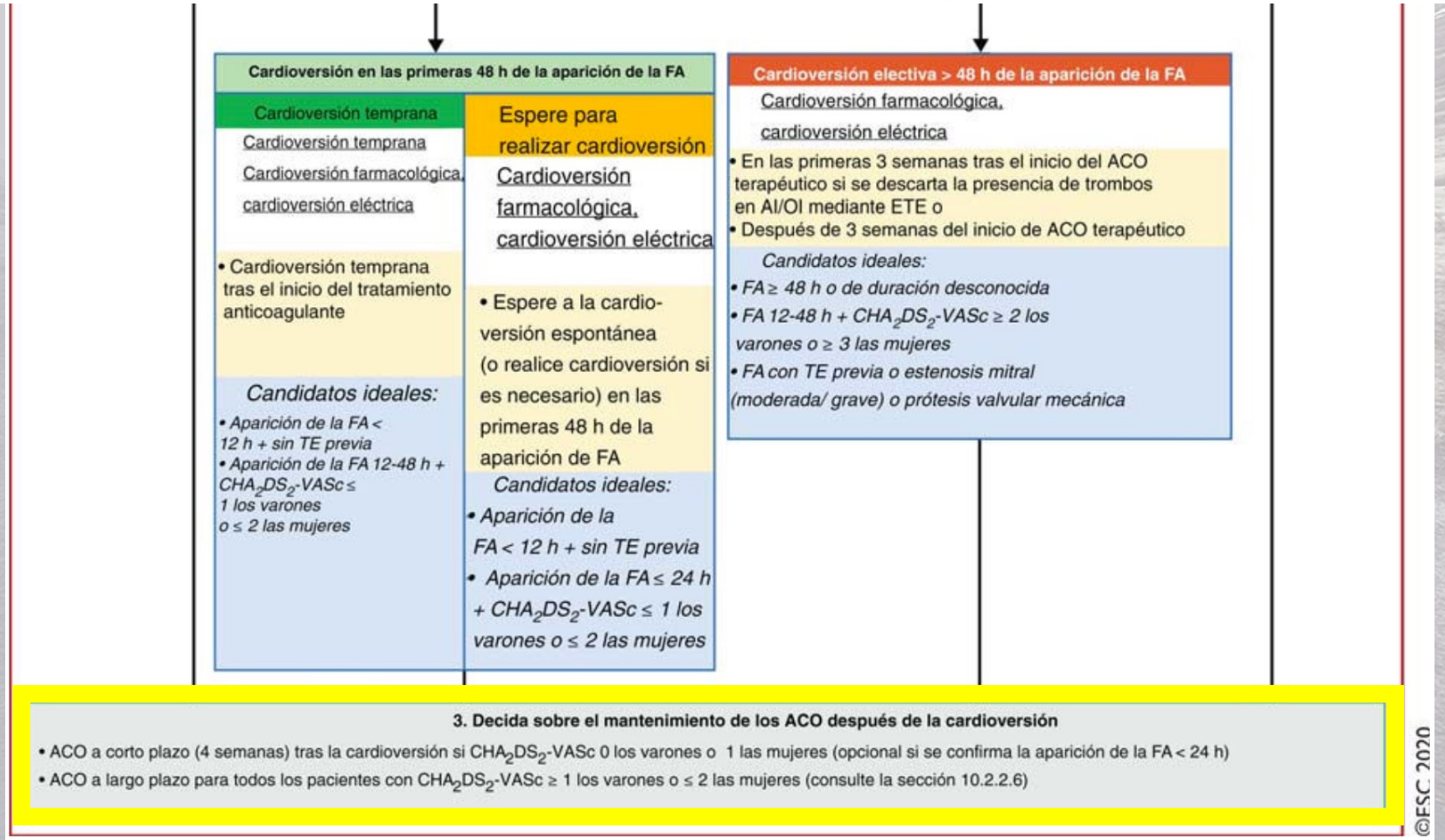

ESC European Society of Cardiology
Europace (2021) 00, 1–65
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POSITION PAPER
EHRA PRACTICAL GUIDE

# 2021 European Heart Rhythm Association Practical Guide on the Use of Non-Vitamin K Antagonist Oral Anticoagulants in Patients with Atrial Fibrillation

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**Keywords** NOACs • DOACs • apixaban • dabigatran • edoxaban • rivaroxaban

## Table of Content



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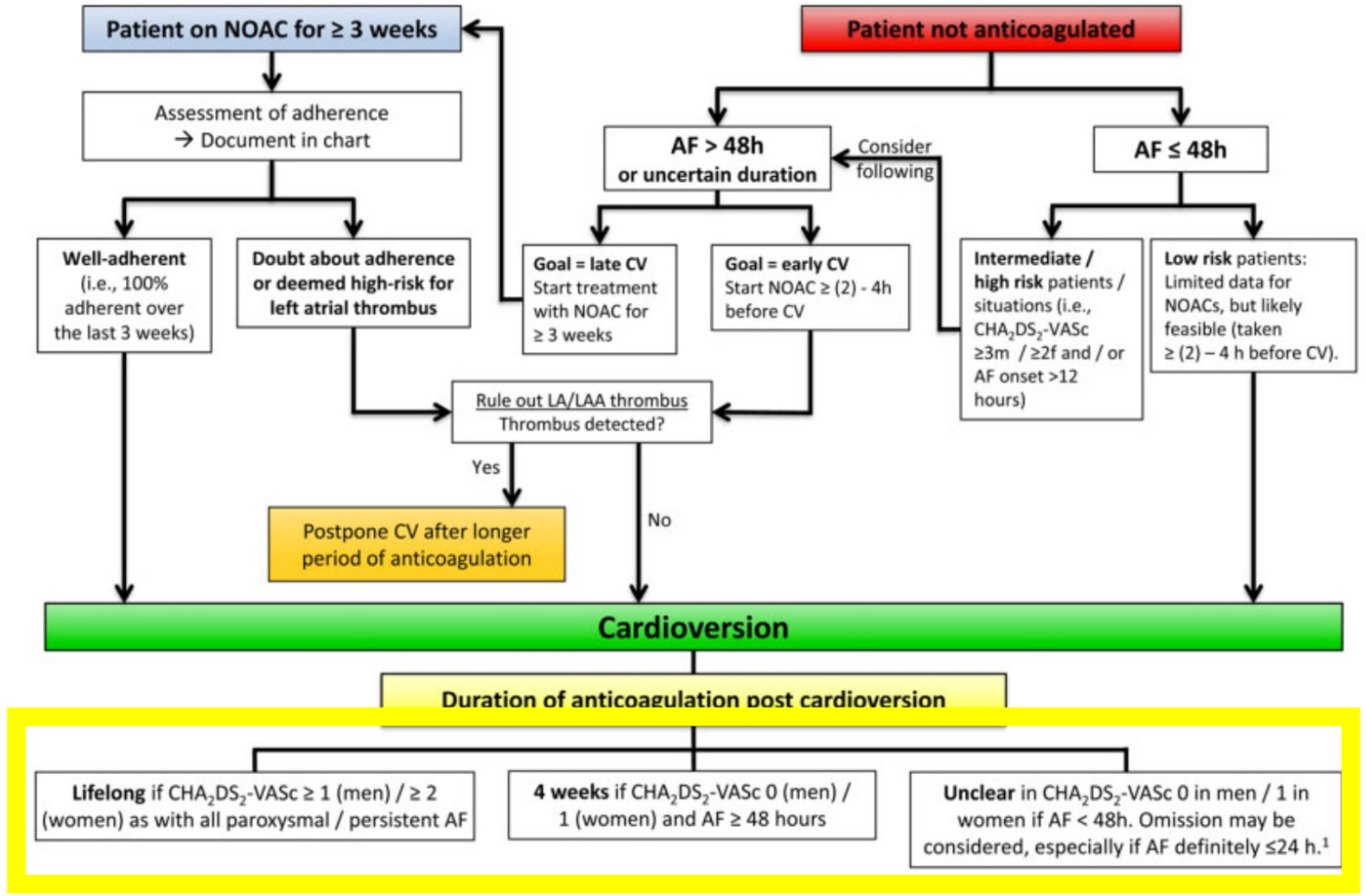
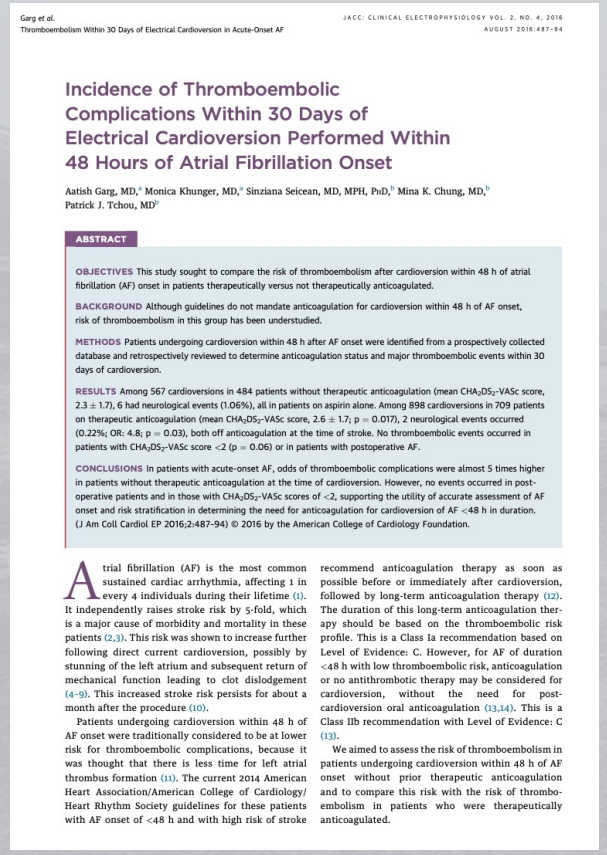



**Figure 19** Cardioversion workflow in AF patients treated with NOAC, depending on the duration of the arrhythmia and prior anticoagulation. AF, atrial fibrillation; CV, cardiovascular; LA, left atrium; LAA, left atrial appendage; NOAC, non-vitamin K antagonist oral anticoagulant.



Garg et al.
Thromboembolism Within 30 Days of Electrical Cardioversion in Acute-Onset AF

JACC: CLINICAL ELECTROPHYSIOLOGY VOL. 2, NO. 4, 2016
AUGUST 2016:487–94

## Incidence of Thromboembolic Complications Within 30 Days of Electrical Cardioversion Performed Within 48 Hours of Atrial Fibrillation Onset

Aatish Garg, MD,[a] Monica Khunger, MD,[a] Sinziana Seicean, MD, MPH, PhD,[b] Mina K. Chung, MD,[b] Patrick J. Tchou, MD[b]

**ABSTRACT**

**OBJECTIVES** This study sought to compare the risk of thromboembolism after cardioversion within 48 h of atrial fibrillation (AF) onset in patients therapeutically versus not therapeutically anticoagulated.

**BACKGROUND** Although guidelines do not mandate anticoagulation for cardioversion within 48 h of AF onset, risk of thromboembolism in this group has been understudied.

**METHODS** Patients undergoing cardioversion within 48 h after AF onset were identified from a prospectively collected database and retrospectively reviewed to determine anticoagulation status and major thromboembolic events within 30 days of cardioversion.

**RESULTS** Among 567 cardioversions in 484 patients without therapeutic anticoagulation (mean $CHA_2DS_2$-VASc score, 2.3 ± 1.7), 6 had neurological events (1.06%), all in patients on aspirin alone. Among 898 cardioversions in 709 patients on therapeutic anticoagulation (mean $CHA_2DS_2$-VASc score, 2.6 ± 1.7; p = 0.017), 2 neurological events occurred (0.22%; OR: 4.8; p = 0.03), both off anticoagulation at the time of stroke. No thromboembolic events occurred in patients with $CHA_2DS_2$-VASc score <2 (p = 0.06) or in patients with postoperative AF.

**CONCLUSIONS** In patients with acute-onset AF, odds of thromboembolic complications were almost 5 times higher in patients without therapeutic anticoagulation at the time of cardioversion. However, no events occurred in post-operative patients and in those with $CHA_2DS_2$-VASc scores of <2, supporting the utility of accurate assessment of AF onset and risk stratification in determining the need for anticoagulation for cardioversion of AF <48 h in duration.
(J Am Coll Cardiol EP 2016;2:487–94) © 2016 by the American College of Cardiology Foundation.

Atrial fibrillation (AF) is the most common sustained cardiac arrhythmia, affecting 1 in every 4 individuals during their lifetime (1). It independently raises stroke risk by 5-fold, which is a major cause of morbidity and mortality in these patients (2,3). This risk was shown to increase further following direct current cardioversion, possibly by stunning of the left atrium and subsequent return of mechanical function leading to clot dislodgement (4–9). This increased stroke risk persists for about a month after the procedure (10).

Patients undergoing cardioversion within 48 h of AF onset were traditionally considered to be at lower risk for thromboembolic complications, because it was thought that there is less time for left atrial thrombus formation (11). The current 2014 American Heart Association/American College of Cardiology/Heart Rhythm Society guidelines for these patients with AF onset of <48 h and with high risk of stroke recommend anticoagulation therapy as soon as possible before or immediately after cardioversion, followed by long-term anticoagulation therapy (12). The duration of this long-term anticoagulation therapy should be based on the thromboembolic risk profile. This is a Class Ia recommendation based on Level of Evidence: C. However, for AF of duration <48 h with low thromboembolic risk, anticoagulation or no antithrombotic therapy may be considered for cardioversion, without the need for post-cardioversion oral anticoagulation (13,14). This is a Class IIb recommendation with Level of Evidence: C (13).

We aimed to assess the risk of thromboembolism in patients undergoing cardioversion within 48 h of AF onset without prior therapeutic anticoagulation and to compare this risk with the risk of thromboembolism in patients who were therapeutically anticoagulated.

**TABLE 3 Thromboembolic Events Stratified by the $CHA_2DS_2$-VASc Scores of Patients Undergoing Cardioversion**

| $CHA_2DS_2$-VASc Score | Total Patients in All Groups | Total Events (%) | All Patients in Group 1 (%) | Events in Group 1 (%) | All Patients in Group 3 (%) | Events in Group 3 (%) |
|---|---|---|---|---|---|---|
| 0 | 204 | 0 | 85 (41.7) | 0 | 99 (48.5) | 0 |
| 1 | 293 | 0 | 103 (35.2) | 0 | 163 (55.6) | 0 |
| 2 | 351 | **2 (0.6)** | 136 (38.8) | **2 (1.5)** | 187 (53.3) | 0 |
| 3 | 318 | **1 (0.3)** | 108 (34.0) | **1 (0.9)** | 191 (60.1) | 0 |
| 4 | 215 | **3 (1.4)** | 77 (35.8) | **2 (2.6)** | 127 (59.1) | **1 (0.8)** |
| 5 | 115 | **1 (0.9)** | 33 (28.7) | **1 (3.0)** | 76 (66.1) | 0 |
| 6 | 63 | **1 (1.6)** | 19 (30.2) | 0 | 39 (61.9) | **1 (2.6)** |
| 7 | 15 | 0 | 5 (33.3) | 0 | 10 (67.7) | 0 |
| 8 | 6 | 0 | 0 | 0 | 6 (100.0) | 0 |
| 9 | 1 | 0 | 1 (100.0) | 0 | 0 | 0 |

Values are n (%). Group 1: No anticoagulation (mean $CHA_2DS_2$-VASc, 2.30 ± 1.17). Group 3: Therapeutic anticoagulation (mean $CHA_2DS_2$-VASc, 2.62 ± 1.7). Group 2 is not described here because there were no reported events in this group. **Bolded** text indicates subjects with thromboembolic events.

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EM - ORIGINAL

# Safety of cardioversion in atrial fibrillation lasting less than 48 h without post-procedural anticoagulation in patients at low cardioembolic risk

**Andrea Tampieri[1] · Valentina Cipriano[1] · Fabrizio Mucci[1] · Anna Maria Rusconi[2] · Tiziano Lenzi[1] · Patrizia Cenni[1]**

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**Abstract** Currently, there is no unified consensus on short-term anticoagulation after cardioversion of atrial fibrillation lasting less than 48 h in low-cardioembolic-risk patients. The aim of this study is to evaluate the rate of transient ischemic attacks, stroke and death in this subset of patients after cardioversion without post-procedural anticoagulation. In a prospective observational study, patients with recent-onset AF undergoing cardioversion attempts in the Emergency Department were evaluated over the past 3 years. Inclusion criteria were conversion to sinus rhythm, low thromboembolic risk defined by a CHA2DS2VASc score of 0–1 points for males (0–2 points for females aged over 65 years), and hospital discharge without anticoagulant treatment. Patients with severe valvular heart disease, underlying systemic causes of AF, and those discharged with anticoagulant therapy were excluded. The main outcomes measured were TIA, stroke and death at thirty days' follow-up after discharge. During the study period, 218 successful cardioversions, obtained both electrically and pharmacologically, were performed on 157 patients. One hundred and eleven patients were males (71%), the mean age was 55.2 years (±standard deviation 10.7), 99 patients (63%) reported a CHA2DS2VASc score of 0, and the remaining 58 (37%) had a risk profile of 1 point. Of these, latter 8 were females (5%) older than 65 years (risk score 2 points). At the thirty days outcome, none of the 150 enrolled patients who completed a follow-up visit has reported TIA or stroke, nor died, in the overall 211 successful cardioversions evaluated. In our study, the rate of thromboembolic events after cardioversion of recent-onset AF of less than 48 h duration, in patients with a 0–1 CHA2DS2VASc risk profile (females 0–2), appeared to be extremely low even in absence of post-procedural anticoagulation. These findings seem to confirm data from previous studies, and suggest that routine post-procedural short-term anticoagulation may be considered as an overtreatment in this very low-risk subset of patients.

**Keywords** Atrial fibrillation · Stroke · Cardioversion · Short-term anticoagulation · Cardioembolic risk

## Introduction

Atrial fibrillation (AF) is well recognised to be the most common dysrhythmia worldwide, and its prevalence is estimated to increase in the coming years, resulting in an increase of admission to the Emergency Department (ED) for symptoms related to this cardiac rhythm abnormality [1]. Usually, recent-onset AF is treated with either pharmacological or electrical cardioversion in the ED, and in recent years, several protocols designed to accelerate conversion to sinus rhythm (SR) have been developed in this setting, recording a low rate of thromboembolic complications even in the absence of peri-procedural anticoagulant treatment [2–7]. In any case, regardless of the rate or rhythm control strategies adopted, anticoagulation remains a milestone in the management of AF. While it is well established that patients with high thromboembolic risk [CHA2DS2VASc score ≥2; (congestive heart failure, hypertension, age >75 years, diabetes, stroke/TIA, vascular disease, age 65–75, gender category)] should

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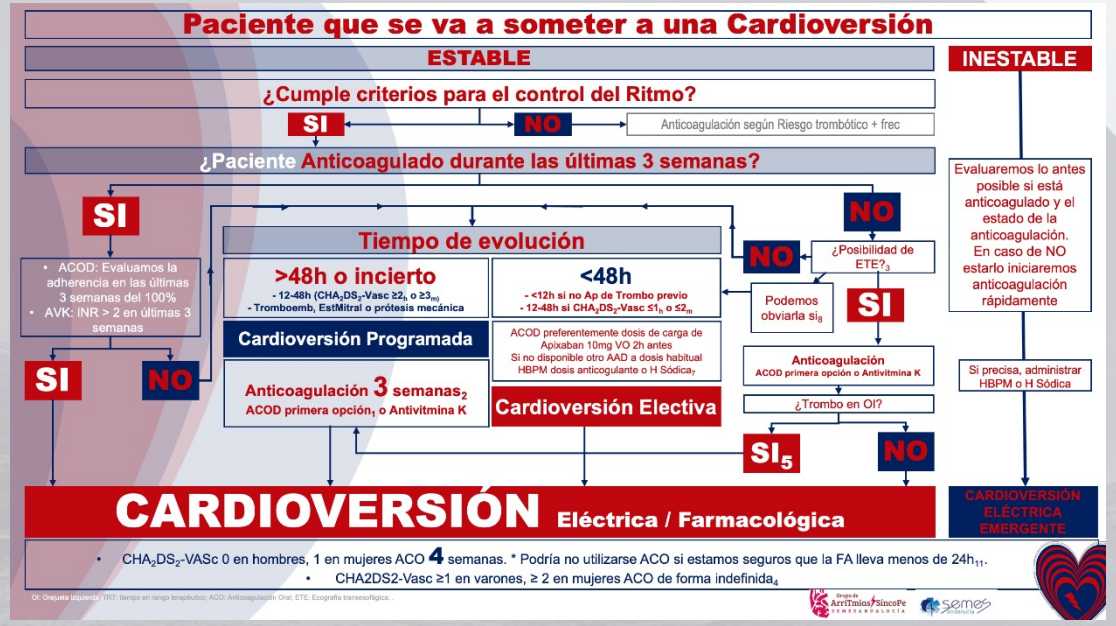
**Table 4** Summary of data reported in relevant studies

| [references]; Author; date | Design | Risk class score | No. cases | Mean age | Male % | Follow-up | Embolic events; rate (%); [95% CI] | Comments |
|---|---|---|---|---|---|---|---|---|
| [2] Decker et al. 2008 | Prospective, randomized trial | *NR* | 153 | 58 | 61 | 6 months | 0; (0); [NR] | Small sample size |
| [3] Michael et al. 1999 | Retrospective, cohort study | *NR* | 289 | 64 | 54 | 7 days | 0; (0); [NR] | Short-term follow-up. 16% of patients taking OAC |
| [4] Burton et al. 2004 | Retrospective, records survey | *NR* | 388 | 61 | 55 | 7 days | 0; (0); [NR] | Short-term follow-up. 19% of patients taking OAC |
| [5] Stiell et al. 2010 | Retrospective, cohort study | *NR* | 660 | 64 | 55 | 7 days | 0; (0); [NR] | Short-term follow-up. 33% of patients taking OAC |
| [6] Scheuremeyer et al. 2010 | Retrospective, cohort study | CHADS2 | 400 | 57 | 74 | 30 days | 0; (0); [0–0.8] | 61% of patients had no risk factor (CHADS2 zero) |
| [7] Vinson et al. 2012 | Prospective, cohort study | *NR* | 206 | 64 | 60 | 30 days | 2; (1); [0.1–3.5] | Both patients were not taking OAC although indicated |
| [12] Cristoni et al. 2011 | Prospective, cohort study | CHADS2 | 322 | 67 | 48 | 6 months | 2; (0.6); [NR] | Both patients were not taking OAC although at high embolic risk |
| [14] Weigner et al. 1997 | Prospective, cohort study | *NR* | 375 | 68 | 43 | up to 7 days | 3; (0.8); [0.2–2.4] | Three patients were not taking OAC despite their high risk class. Short-term follow-up |
| [15] Gallagher et al. 2002 | Retrospective, cohort study | *NR* | 198 | 63 | 68 | 30 days | 1; (0.5); [NR] | Retrospective review of records |
| [21] Airaksinen et al. 2013 | Retrospective, cohort study | CHADS2 CHA2DS2VASc | 5116 | 61 | 63 | 30 days | 38; (0.7); [0.5–1] | 28/38 Patients were not taking OAC despite their high risk class (CHA2DS2VAS ≥ 2) |

*CI* confidence intervals, *NR* not reported, *OAC* long-term oral anticoagulant treatment, *CHADS2 score* congestive heart failure, hypertension; age >75 years; diabetes; stroke doubled

# POSICIONAMIENTO SEMES ANDALUCÍA




**INDICACIONES SEGÚN Informe de Posicionamiento Terapéutico del Sistema Nacional de Salud:**

Para realizar una indicación financiada de un anticoagulante de acción directa en el Sistema sanitario Español se deben cumplir los siguientes criterios:

Puntuación **$CHA_2DS_2$-Vasc ≥2** y al menos una de las siguientes situaciones:

- Alergia o hipersensibilidad demostrada a cumarínicos, reacciones adversas graves asociadas al tratamiento con antagonistas de la vitamina K (AVK), contraindicaciones específicas para el uso de AVK o presencia de una interacción farmacológica relevante, de difícil control a pesar del ajuste posológico en función del INR [que no haya sido descrita para los anticoagulantes orales directos (ACOD)].
- Antecedentes de hemorragia intracraneal (HIC) (excepto durante la fase aguda)
- Ictus isquémico con criterios de alto riesgo de HIC, definido como HAS-BLED >= 3 y al menos uno de los siguientes criterios clínicos: leucoaraiosis grado III-IV y/o microsangrados corticales múltiples
- Pacientes en tratamiento con AVK que sufren episodios tromboembólicos arteriales graves a pesar de un buen control del INR†
- Pacientes que han iniciado tratamiento con AVK y tienen mal control del INR† (no motivado por falta de adherencia al tratamiento). Especificar Valoración del mal control: _____
- Imposibilidad de acceso al control de INR convencional. Especificar Motivo

## Dosis de Fármacos

### ANTICOAGULANTES acción directa

| DABIGATRÁN (Pradaxa®) | RIVAROXABÁN (Xarelto®) | APIXABAN (Eliquis®) | EDOXABAN (Lixiana®) |
|---|---|---|---|
| **150 mg/12h** | **20 mg/24h** | **5 mg/12h** | **60 mg/24h** |
| **110 mg/12h si alguno:**<br>- ≥ 80 años<br>- Verapamilo<br>- Gastritis, esofagitis, RGE<br>- ACr 30-49ml/min y alto R.Hemorrágico<br>- 75-79 años si Riesgo Embólico bajo y R.Hemorrágico alto | **15 mg/24h si:**<br>-IRenal moderada (ACr 30-49ml/min)<br>- IRenal grave (ACr 15-29ml/min) | **2,5 mg/12h si:**<br>Al menos dos:<br>- Edad ≥ 80 años<br>- Peso ≤ 60 Kg<br>- Creatinina sérica ≥ 1,5mg/dl<br>**DOSIS DE CARGA: 10MG** | **30 mg/24h si:**<br>Un factor:<br>- Acr 15-50mL/min<br>- Peso ≤ 60 Kg<br>- Dronedarona, ciclosporina, eritromicina o ketoconazol |

### ACENOCUMAROL (SINTROM®)

- 2mg/24h + HBPM a dosis según el centro, hasta valoración por hematología (Máximo 3-4 días)
- 1mg cada 24h + HBPM a dosis según el protocolo local, hasta valoración por hematología (en máximo 3-4 días) si >75 años, INR>1,2, Insuficiencia hepática severa, desnutrición, cirugía reciente, enfermedades concomitantes graves, ICC, medicamentos que faciliten el sangrado.

### Heparina de Bajo Peso Molecular/Heparina Sódica

Solo tiene cabida su indicación en inicio de tratamiento anticoagulante con antivitamina K y en cardioversión urgente o inestable en pacientes previamente no anticoagulados o pobremente anticoagulados. DOSIS:
- ENOXAPARINA: 1MG/Kg cada 12h
- HEPARINA SÓDICA: 80UI/kg en bolo o 5000 UI independiente del peso

Desde el punto de vista de SEMES Andalucia se debe indicar en primer lugar siempre que sea posible un Anticoagulante de acción directa (Dabigatrán, Rivaroxabán, Apixabán, Edoxabán). En caso de Cardioversión Urgente debería considerarse la dosis de carga de Apixabán en primer lugar salvo contraindicación.

## Criterios para el control del Ritmo

### ¿Buscamos Ritmo Sinusal?

| NO | SI |
|---|---|
| Alta probabilidad de recurrencia:<br>- duración de la arritmia >2años<br>- Múltiples CV previas o fracaso de fármacos (si no criterios de ablación)<br>- >80 años<br>- Recaída precoz (<1mes)<br>- Valvulopatía mitral<br>- Aurícula izquierda severamente dilatada (>55mm)<br>- Mala tolerancia o elevado riesgo de proarritmia con los fármacos para el mantenimiento del ritmo.<br>- Rechazo del paciente | - Pacientes jóvenes<br>- Primer episodio de FA o corta evolución<br>- Taquimiocardiopatía<br>- Hª previa de FA paroxística<br>- FA 2ª a enfermedad transitoria o corregible.<br>- Difícil control de la frecuencia.<br>- FA que produce sintomatología grave<br>- Elección del paciente<br>- Volumen Auricular izquierdo normal o escasamente aumentado<br>- Ninguna o pocas comorbilidades/patología cardíaca |

## Criterios de Cardioversión Programada

Fibrilación auricular de **más de 48 horas** de duración **≥48h o duración incierta, 12-48h ($CHA_2DS_2$-Vasc ≥$2_h$ o ≥$3_m$, tromboembolismo previo, Estenosis Mitral moderada/grave o prótesis mecánica**
No cumple criterios en contra de control del ritmo
No presenta criterios de cardioversión urgente
No presenta criterios de Ingreso.

## Criterios de Cardioversión Electiva (en el episodio actual)

Fibrilación auricular de **<12h si no Ap de Trombo previo, 12-48h si $CHA_2DS_2$-Vasc ≤$1_h$ o ≤$2_m$** y no antecedentes personales de tromboembilismo previo.
No cumple criterios en contra de control del ritmo
No presenta criterios de cardioversión programada
Inestabilidad hemodinámica

## Recomendaciones sobre el control de ictus antes, durante y después de la cardioversión:

1.- Para pacientes con FA que van a someterse a cardioversión, se recomienda la administración de NACO con un perfil de eficacia y seguridad al menos similar al de la warfarina (IA)
2.- Para la cardioversión de la FA/flutter auricular, se recomienda la anticoagulación efectiva durante un mínimo de 3 semanas antes de la cardioversión (IB)
3.- Se recomienda la ETE para excluir trombos cardiacos como alternativa a la anticoagulación durante las 3 semanas previas al procedimiento cuando se planifica una cardioversión precoz (IB)
4.- Para pacientes con riesgo de ictus, se recomienda mantener el tratamiento anticoagulante a largo plazo después de la cardioversión según las recomendaciones específicas sobre anticoagulación por tiempo indefinido, independientemente del método empleado para la cardioversión, el mantenimiento aparente del ritmo sinusal o la caracterización de la FA como un «episodio diagnosticado por primera vez» (IB)
5.- Para pacientes con trombos identificados por ETE, se recomienda la anticoagulación efectiva durante al menos 3 semanas antes de la cardioversión de la FA (IB)
6.- Se recomienda advertir seriamente a los pacientes sobre la importancia de la adherencia y la continuidad del tratamiento con NACO antes y después de la cardioversión (IC)
7.- Se debe iniciar la anticoagulación efectiva tan pronto sea posible antes de cada cardioversión de la FA o flutter auricular (IIa B)
8.- La cardioversión precoz se puede realizar sin ETE en pacientes con una duración de la FA < 48 h (IIa B)
9.- Para pacientes con una duración de la FA > 24 h que se someten a cardioversión, se debe continuar la anticoagulación terapéutica durante al menos 4 semanas, aunque se haya logrado la cardioversión a ritmo sinusal (la decisión de mantener los ACO a largo plazo está determinada por la presencia de factores de riesgo de ictus) (IIa B)
10. Para pacientes con trombos identificados por ETE, se debe considerar la repetición del estudio ecocardiográfico para confirmar la resolución del trombo antes de la cardioversión (IIa C)
11.- Para pacientes con una duración evidente de la FA ≤ 24 h y riesgo muy bajo de ictus (CHA2DS2-VASc de 0 puntos los varones y 1 punto las mujeres), se podría omitir la anticoagulación durante las 4 semanas posteriores a la cardioversión (IIb C)
12.- Cuando se administre un avk se recomienda un INR de 2-3 con un TRT individual >=70%

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## INDICACIONES SEGÚN Informe de Posicionamiento Terapéutico del Sistema Nacional de Salud:

Para realizar una indicación financiada de un anticoagulante de acción directa en el Sistema sanitario Español se deben cumplir los siguientes criterios:

Puntuación **$CHA_2DS_2$-Vasc ≥2** y al menos una de las siguientes situaciones:

- Alergia o hipersensibilidad demostrada a cumarínicos, reacciones adversas graves asociadas al tratamiento con antagonistas de la vitamina K (AVK), contraindicaciones específicas para el uso de AVK o presencia de una interacción farmacológica relevante, de difícil control a pesar del ajuste posológico en función del INR [que no haya sido descrita para los anticoagulantes orales directos (ACOD)].
- Antecedentes de hemorragia intracraneal (HIC) (excepto durante la fase aguda)
- Ictus isquémico con criterios de alto riesgo de HIC, definido como HAS-BLED >= 3 y al menos uno de los siguientes criterios clínicos: leucoaraiosis grado III-IV y/o microsangrados corticales múltiples
- Pacientes en tratamiento con AVK que sufren episodios tromboembólicos arteriales graves a pesar de un buen control del INR†
- Pacientes que han iniciado tratamiento con AVK y tienen mal control del INR† (no motivado por falta de adherencia al tratamiento). Especificar Valoración del mal control: _____
- Imposibilidad de acceso al control de INR convencional. Especificar Motivo

# Dosis de Fármacos

## ANTICOAGULANTES acción directa

| DABIGATRÁN (Pradaxa®) | RIVAROXABÁN (Xarelto®) | APIXABAN (Eliquis®) | EDOXABAN (Lixiana®) |
|---|---|---|---|
| **150 mg/12h** | **20 mg/24h** | **5 mg/12h** | **60 mg/24h** |
| **110 mg/12h si alguno:**<br>- ≥ 80 años<br>- Verapamilo<br>- Gastritis, esofagitis, RGE<br>- ACr 30-49ml/min y alto R.Hemorrágico<br>- 75-79 años si Riesgo Embólico bajo y R.Hemorrágico alto | **15 mg/24h si:**<br>-IRenal moderada (ACr 30-49ml/min)<br>- IRenal grave (ACr 15-29ml/min) | **2,5 mg/12h si:**<br>Al menos dos:<br>- Edad ≥ 80 años<br>- Peso ≤ 60 Kg<br>- Creatinina sérica ≥ 1,5mg/dl<br>**DOSIS DE CARGA: 10MG** | **30 mg/24h si:**<br>Un factor:<br>- Acr 15-50mL/min<br>- Peso ≤ 60 Kg<br>- Dronedarona, ciclosporina, eritromicina o ketoconazol |

## ACENOCUMAROL (SINTROM®)

- 2mg/24h + HBPM a dosis según el centro, hasta valoración por hematología (Máximo 3-4 días)
- 1mg cada 24h + HBPM a dosis según el protocolo local, hasta valoración por hematología (en máximo 3-4 días) si >75 años, INR>1,2, Insuficiencia hepática severa, desnutrición, cirugía reciente, enfermedades concomitantes graves, ICC, medicamentos que faciliten el sangrado.

## Heparina de Bajo Peso Molecular/Heparina Sódica

Solo tiene cabida su indicación en inicio de tratamiento anticoagulante con antivitamina K y en cardioversión urgente o inestable en pacientes previamente no anticoagulados o pobremente anticoagulados. DOSIS:

- ENOXAPARINA: 1MG/Kg cada 12h
- HEPARINA SÓDICA: 80UI/kg en bolo o 5000 UI independiente del peso

Desde el punto de vista de SEMES Andalucia se debe indicar en primer lugar siempre que sea posible un Anticoagulante de acción directa (Dabigatrán, Rivaroxabán, Apixabán, Edoxabán). En caso de Cardioversión Urgente debería considerarse la dosis de carga de Apixabán en primer lugar salvo contraindicación.

# Criterios para el control del Ritmo

## ¿Buscamos Ritmo Sinusal?

| NO | SI |
|---|---|
| Alta probabilidad de recurrencia:<br>- duración de la arritmia >2años<br>- Múltiples CV previas o fracaso de fármacos (si no criterios de ablación)<br>- >80 años<br>- Recaída precoz (<1mes)<br>- Valvulopatía mitral<br>- Aurícula izquierda severamente dilatada (>55mm)<br>- Mala tolerancia o elevado riesgo de proarritmia con los fármacos para el mantenimiento del ritmo.<br>- Rechazo del paciente | - Pacientes jóvenes<br>- Primer episodio de FA o corta evolución<br>- Taquimiocardiopatía<br>- Hª previa de FA paroxística<br>- FA 2ª a enfermedad transitoria o corregible.<br>- Difícil control de la frecuencia.<br>- FA que produce sintomatología grave<br>- Elección del paciente<br>- Volumen Auricular izquierdo normal o escasamente aumentado<br>- Ninguna o pocas comorbilidades/patología cardíaca |

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