# Recomanacions en el tractament no farmacològic de la insuficiència cardíaca


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**Hospital Universitari Vall d'Hebrón**

# Recomanacions

- Dispositius implantables
  - DAI
  - Resincronització cardíaca
  - Altres dispositius implantables
- Arítmies
  - Fibril.lació auricular
  - Arítmies ventriculars
  - Bradiarítmies
- Comorbilitats
  - Cardiopatia isquèmica
  - Patologia de la son
  - Patologia valvular
- Assistència ventricular i trasplantament cardíac
  - Assistència ventricular
  - Trasplantament cardíac

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# Indicacions de DAI

**Recommendations for implantable cardioverter-defibrillator in patients with heart failure**

| Recommendations | Class [a] | Level [b] | Ref [c] |
|---|---|---|---|
| **Secondary prevention**<br>An ICD is recommended to reduce the risk of sudden death and all-cause mortality in patients who have recovered from a ventricular arrhythmia causing haemodynamic instability, and who are expected to survive for >1 year with good functional status. | I | A | 223–226 |
| **Primary prevention**<br>An ICD is recommended to reduce the risk of sudden death and all-cause mortality in patients with symptomatic HF (NYHA Class II–III), and an LVEF ≤35% despite ≥3 months of OMT, provided they are expected to survive substantially longer than one year with good functional status, and they have: | | | |
| • IHD (unless they have had an MI in the prior 40 days – see below). | I | A | 149, 156, 227 |
| • DCM. | I | B | 156, 157, 227 |
| ICD implantation is not recommended within 40 days of an MI as implantation at this time does not improve prognosis. | III | A | 158, 228 |
| ICD therapy is not recommended in patients in NYHA Class IV with severe symptoms refractory to pharmacological therapy unless they are candidates for CRT, a ventricular assist device, or cardiac transplantation. | III | C | 229–233 |
| Patients should be carefully evaluated by an experienced cardiologist before generator replacement, because management goals and the patient's needs and clinical status may have changed. | IIa | B | 234–238 |
| A wearable ICD may be considered for patients with HF who are at risk of sudden cardiac death for a limited period or as a bridge to an implanted device. | IIb | C | 239–241 |

AVID, CASH, CIDS, metaanálisis

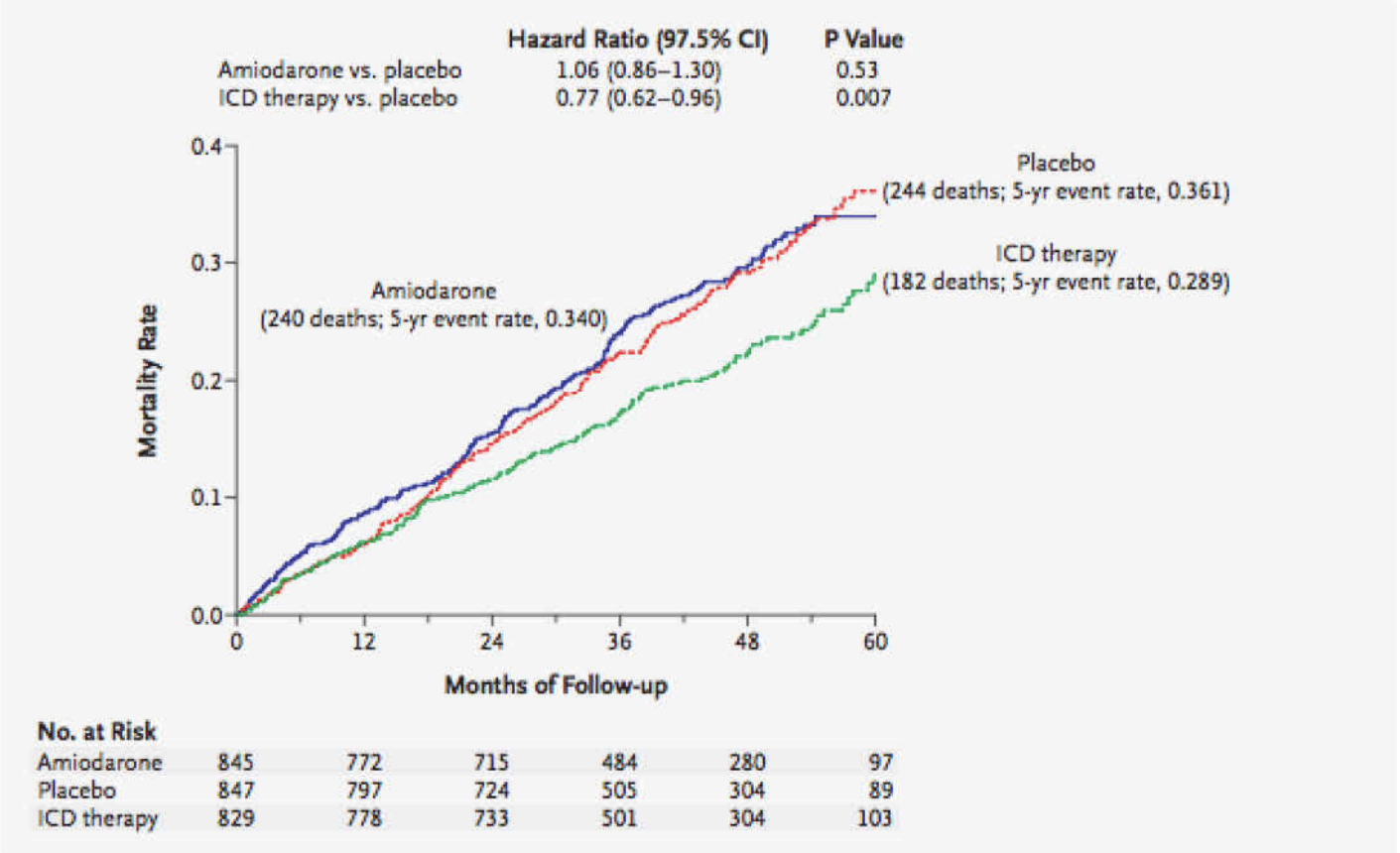
MADIT II, SCD-HeFT

Metaanálisis, DEFINITE, SCD-HeFT*

DINAMIT, IRIS

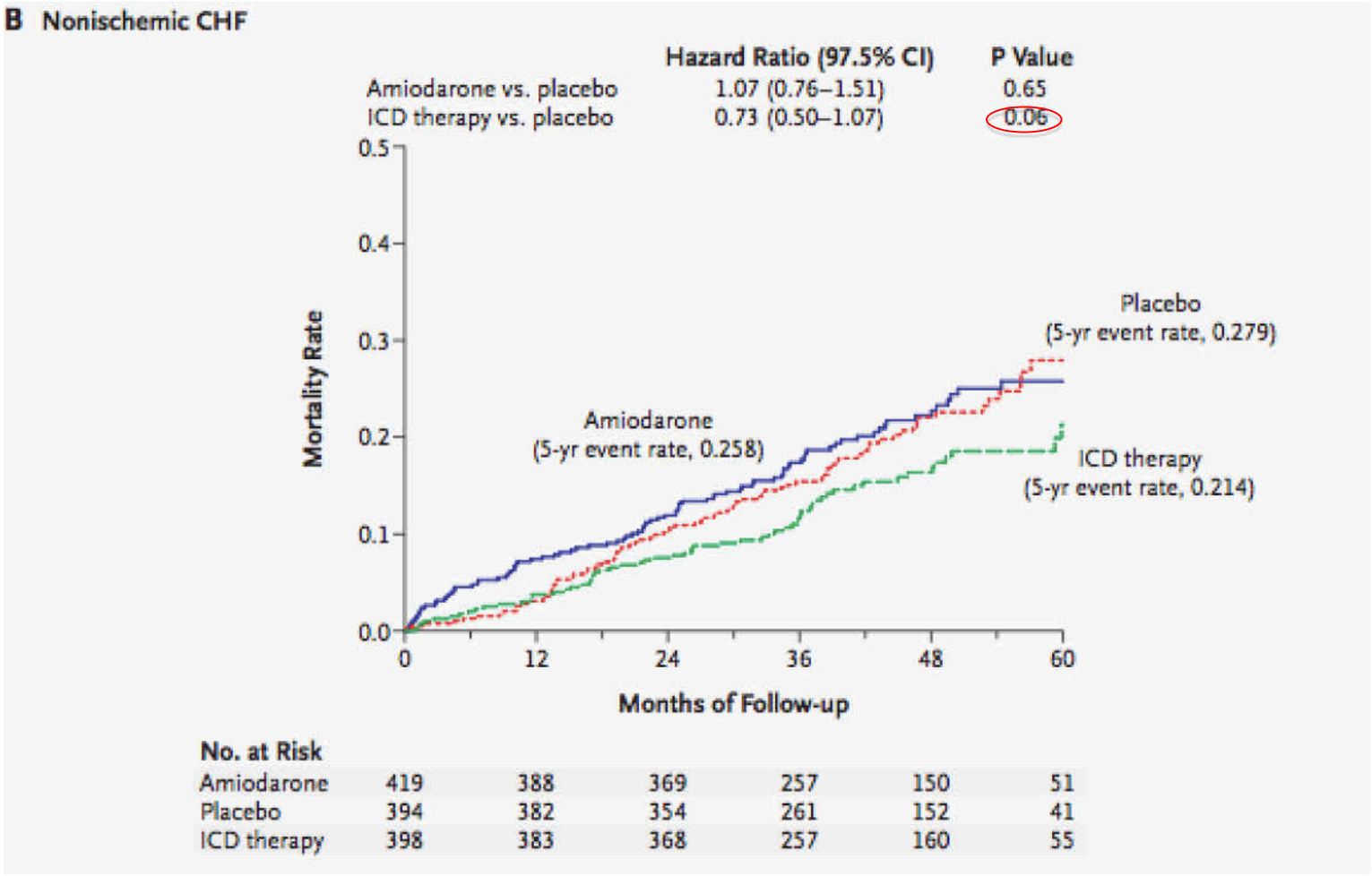
# SCD HeFT

Estudi multicèntric randomitzat
2521p m. isquèmica i no isquèmica , FEVE ≤35%, CF NYHA II-lll
Tt conv vs. tt conv +amio vs. tto conv + DAI




Bardy GH et al. N Engl J Med 2005; 352: 225-37

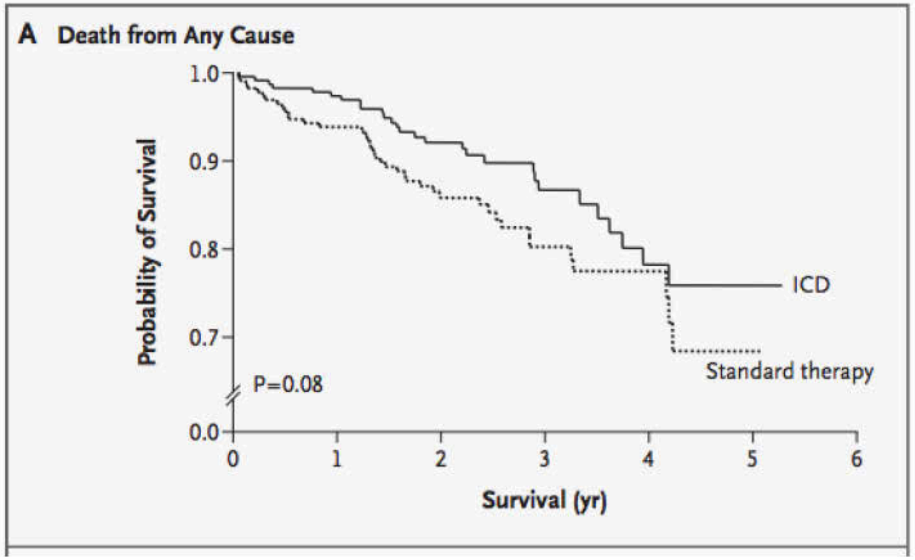
# SCD HeFT. M. No isquèmica

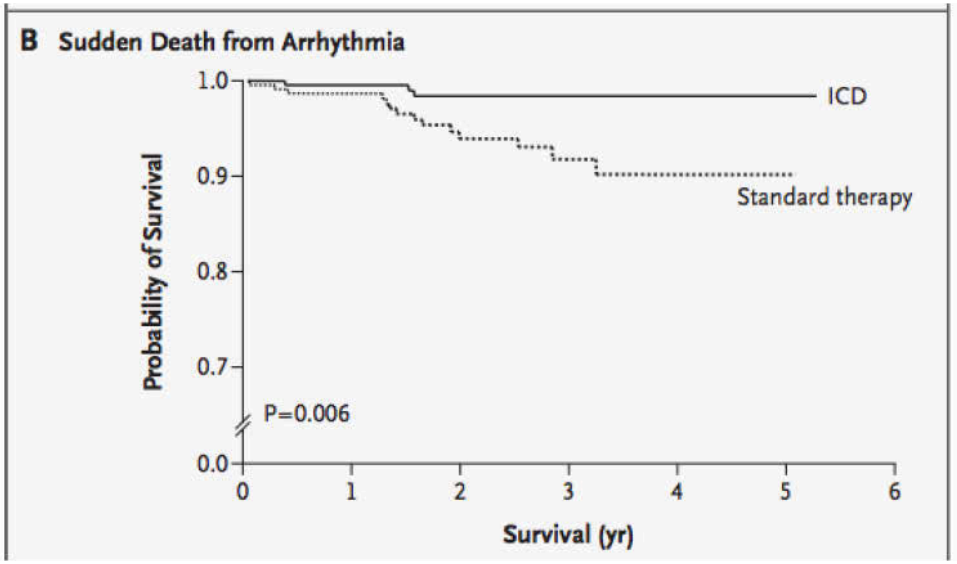



Bardy GH et al. N Engl J Med 2005; 352: 225-37

# Prophylactic Defibrillator Implantation in Patients with Nonischemic Dilated Cardiomyopathy

456 p m. no isquèmica, FEVE <36%, EEVV o TVNS
Randomitzat  a tt conv vs. tt conv + DAI
Seguiment 29 ± 14 mesos



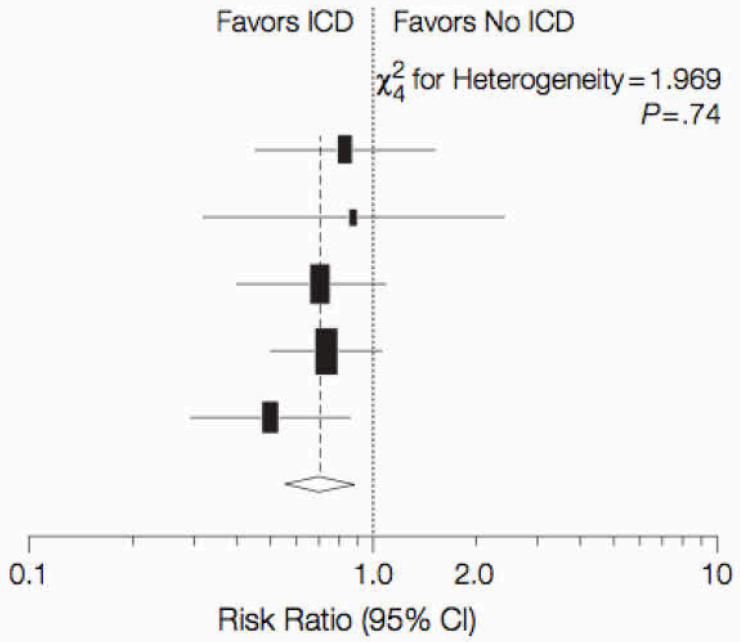

Kadish A et al. N Engl J Med 2004; 350: 2151-8

# Implantable Defibrillators for the Prevention of Mortality in Patients With Nonischemic Cardiomyopathy

## A Meta-analysis of Randomized Controlled Trials

**Figure 3.** All-Cause Mortality Among Patients With NICM Randomized to ICD or CRT-D vs Medical Therapy in Primary Prevention

| Study | Years of Enrollment | No. of Patients | Risk Ratio (95% CI) |
|---|---|---|---|
| CAT[16] | 1991-1997 | 104 | 0.83 (0.45-1.82) |
| AMIOVIRT[17] | 1996-2000 | 103 | 0.87 (0.31-2.42) |
| DEFINITE[15] | 1998-2002 | 458 | 0.65 (0.40-1.06) |
| SCD-HeFT[14] | 1997-2001 | 792 | 0.73 (0.50-1.04) |
| COMPANION[21] | 2000-2002 | 397 | 0.50 (0.29-0.88) |
| **Combined** | | **1854** | **0.69 (0.55-0.87)** |




Desai AS et al. JAMA. 2004;292:2874-2879

ICD implantation is recommended only after a sufficient trial (minimum 3 months) of optimal medical therapy (OMT) has failed to increase the LVEF to >35%. However, one of the two landmark papers on which these recommendations are based included patients with an LVEF >30%. Fewer than 400 patients with an LVEF of 30–35% were included in the landmark studies, and although there was no statistical interaction between treatment effect and LVEF, the evidence of benefit is less robust in this group of patients.

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AVID, CASH, CIDS, metaanálisis

MADIT II, SCD-HeFT

Metaanálisis, DEFINITE, SCD-HeFT

DINAMIT, IRIS

# DAI subcutani

Subcutaneous defibrillators may be as effective as conventional ICDs with a lower risk from the implantation procedure.[256,257] They may be the preferred option for patients with difficult access or who require ICD explantation due to infection. Patients must be carefully selected, as they have limited capacity to treat serious bradyarrhythmia and can deliver neither antitachycardia pacing nor CRT. Substantial RCTs with these devices and more data on safety and efficacy are awaited.[258,259]

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# Indicacions CRT

**Recommendations for cardiac resynchronization therapy implantation in patients with heart failure**

| Recommendations | Class [a] | Level [b] | Ref [c] | |
|---|---|---|---|---|
| CRT is recommended for symptomatic patients with HF in sinus rhythm with a QRS duration ≥150 msec and LBBB QRS morphology and with LVEF ≤35% despite OMT in order to improve symptoms and reduce morbidity and mortality. | I | A | 261–272 | MUSTIC, CARE-HF,COMPANION, RAFT, MADIT-CRT, REVERSE |
| CRT should be considered for symptomatic patients with HF in sinus rhythm with a QRS duration ≥150 msec and non-LBBB QRS morphology and with LVEF ≤35% despite OMT in order to improve symptoms and reduce morbidity and mortality. | IIa | B | 261–272 | |
| CRT is recommended for symptomatic patients with HF in sinus rhythm with a QRS duration of 130–149 msec and LBBB QRS morphology and with LVEF ≤35% despite OMT in order to improve symptoms and reduce morbidity and mortality. | I | B | 266, 273 | |
| CRT may be considered for symptomatic patients with HF in sinus rhythm with a QRS duration of 130–149 msec and non-LBBB QRS morphology and with LVEF ≤35% despite OMT in order to improve symptoms and reduce morbidity and mortality. | IIb | B | 266, 273 | |
| CRT rather than RV pacing is recommended for patients with HFrEF regardless of NYHA class who have an indication for ventricular pacing and high degree AV block in order to reduce morbidity. This includes patients with AF (see Section 10.1). | I | A | 274–277 | BLOCK-HF |
| CRT should be considered for patients with LVEF ≤35% in NYHA Class III–IV[d] despite OMT in order to improve symptoms and reduce morbidity and mortality, if they are in AF and have a QRS duration ≥130 msec provided a strategy to ensure bi-ventricular capture is in place or the patient is expected to return to sinus rhythm. | IIa | B | 275, 278–281 | |
| Patients with HFrEF who have received a conventional pacemaker or an ICD and subsequently develop worsening HF despite OMT and who have a high proportion of RV pacing may be considered for upgrade to CRT. This does not apply to patients with stable HF. | IIb | B | 282 | * |
| CRT is contra-indicated in patients with a QRS duration < 130 msec. | III | A | 266, 283–285 | Echo-CRT |

European Heart Journal (2013) **34**, 2281–2329
doi:10.1093/eurheartj/eht150



# 2013 ESC Guidelines on cardiac pacing and cardiac resynchronization therapy

**Indication for upgraded or *de novo* cardiac resynchronization therapy in patients with conventional pacemaker indications and heart failure**

| Recommendations | Class [a] | Level [b] | Ref. [c] |
|---|---|---|---|
| **1) Upgrade from conventional PM or ICD.** CRT is indicated in HF patients with LVEF <35% and high percentage of ventricular pacing who remain in NYHA class III and ambulatory IV despite adequate medical treatment. [d] | I | B | 47, 108–122 |
| **2) *De novo* cardiac resynchronization therapy.** CRT should be considered in HF patients, reduced EF and expected high percentage of ventricular pacing in order to decrease the risk of worsening HF. | IIa | B | 123–130 |

# Effect of Long-Term Resynchronization Therapy on Left Ventricular Remodeling in Pacemaker Patients Upgraded to Biventricular Devices

Mehmet Akif Vatankulu, MD[a,b,*], Omer Goktekin, MD[a,c], Mehmet Gurkan Kaya, MD[a,d], Selim Ayhan, MD[a,b], Zekeriya Kucukdurmaz, MD[a], Richard Sutton, MD[a], and Michael Henein, MD[a]

Right ventricular pacing resulted in abnormal ventricular depolarization and an activation pattern similar to left branch bundle block. In some circumstances, it may exacerbate symptoms of heart failure and increase hospital admission rates. The objective of this study was to assess the effects of long-term ventricular resynchronization therapy on echocardiographic parameters of left ventricular (LV) remodeling in patients with moderate to severe heart failure who were upgraded from single- to biventricular pacing. Twenty-six consecutive pacemaker-dependent patients (20 men; mean age 61 ± 20 years) who underwent placement of an LV lead to upgrade their conventional pacing system to biventricular pacing were included in the study. All patients had heart failure symptoms, received the maximum tolerated medical therapy, and were stable for ≥1 month before the upgrade. Echocardiography and electrocardiography were performed before the pacemaker upgrade and at follow-up (mean duration 15 ± 9 months). QRS duration decreased significantly from 176 ± 23 to 154 ± 19 ms ($p < 0.001$). LV end-diastolic volume ($p = 0.006$) and LV end-systolic volume ($p = 0.004$) decreased at follow-up compared with baseline. The decrease in LV volumes observed during follow-up was accompanied by a significant increase in ejection fraction (39 ± 11% to 46 ± 10%; $p = 0.001$) and decrease in LV myocardial performance index (0.84 ± 0.18 to 0.68 ± 0.14; $p = 0.001$). The upgrade of conventional pacing to biventricular pacing resulted in significant prolongation of normalized LV filling time ($p = 0.01$) and shortening of isovolumic contraction time (p 0.002). In addition, biventricular pacing significantly (V-V interval = 0) reduced intra- (44 ± 11 vs 18 ± 12 ms; $p < 0.001$) and interventricular dyssynchrony (78 ± 33 vs 49 ± 22 ms; $p < 0.001$). In conclusion, these findings suggested that in patients with advanced heart failure and continuous right ventricular pacing, upgrading to biventricular system resulted in significant reverse LV remodeling in the long-term follow-up and improvement in overall synchronicity of ventricular function.  (Am J Cardiol 2009;103:1280–1284)

# Indicacions CRT

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| CRT is contra-indicated in patients with a QRS duration < 130 msec. | III | A | 266, 283–285 |

MUSTIC, CARE-HF,COMPANION, RAFT, MADIT-CRT, REVERSE

BLOCK-HF

Echo-CRT*

# Cardiac-Resynchronization Therapy in Heart Failure with a Narrow QRS Complex

809 p, FEVE ≤ 35%, CF III-IV NYHA , QRS <130ms + asincronía per ecocardio
Implant CRT
Randomitzats a CRT "on" vs. "off"

**Table 2. Protocol-Specified Cardiovascular Outcomes.***

| Outcome | Control Group (N=405) | CRT Group (N=404) | Adjusted Hazard Ratio (95% CI) | P Value |
|---|---|---|---|---|
| | *no. of patients with event (%)* | | | |
| **Primary composite outcome** | | | | |
| Death from any cause or hospitalization for heart failure | 102 (25.2) | 116 (28.7) | 1.20 (0.92–1.57) | 0.15 |
| **Components of primary outcome** | | | | |
| Hospitalization for heart failure | 90 (22.2) | 99 (24.5) | 1.16 (0.87–1.55) | 0.25 |
| Death from any cause | 26 (6.4) | 45 (11.1) | 1.81 (1.11–2.93) | 0.02 |
| **Other cardiovascular outcomes** | | | | |
| Hospitalization for cardiovascular event | 137 (33.8) | 147 (36.4) | 1.11 (0.88–1.40) | 0.36 |
| Death | | | | |
| Cardiovascular event | 17 (4.2) | 37 (9.2) | 2.26 (1.27–4.01) | 0.004 |
| Heart failure | 10 (2.5) | 17 (4.2) | 1.74 (0.80–3.81) | 0.15 |
| Follow-up data censored | | | | |
| Owing to LVAD implantation | 10 (2.5) | 7 (1.7) | — | — |
| Owing to heart transplantation | 5 (1.2) | 3 (0.7) | — | — |
| Death after data were censored owing to LVAD implantation or heart transplantation† | 4 (1.0) | 1 (0.2) | — | — |

Ruschitza F et al. N Engl J Med 2013;369:1395-405

# The effect of QRS duration on cardiac resynchronization therapy in patients with a narrow QRS complex: a subgroup analysis of the EchoCRT trial


**Aims** In EchoCRT, a randomized trial evaluating the effect of cardiac resynchronization therapy (CRT) in patients with a QRS duration of <130 ms and echocardiographic evidence of left ventricular dyssynchrony, the primary outcome occurred more frequently in the CRT when compared with the control group. According to current heart failure guidelines, CRT is recommended in patients with a QRS duration of ≥120 ms. However, there is some ambiguity from clinical trial data regarding the benefit of patients with a QRS duration of 120–130 ms.

**Methods and results** The main EchoCRT trial was prematurely terminated due to futility. For the current subgroup analysis we compared data for CRT-ON vs. -OFF in patients with QRS < 120 ($n = 661$) and QRS 120–130 ms ($n = 139$). On uni- and multivariable analyses, no significant interaction was observed between the two groups and randomized treatment for the primary or any of the secondary endpoints. On multivariable analysis, a higher risk for the primary endpoint was observed in patients with a QRS duration of 120–130 ms randomized to CRT-ON vs. CRT-OFF (hazard ratio 2.18, 95% CI 1.02–4.65; $P = 0.044$). However, no statistically significant interaction, compared with patients with QRS < 120 ms randomized to CRT-ON vs. CRT-OFF, was noted ($P$-interaction = 0.160).

**Conclusions** In this pre-specified subgroup analysis of EchoCRT, no benefit of CRT was evident in patients with a QRS duration of 120–130 ms. These data further question the usefulness of CRT in this patient population.


Steffel J et al. Eur Heart J 2015 36, 1983–1989

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  - Assistència ventricular
  - Trasplantament cardíac

# Altres dispositius implantables

- Terapia d'activació baroreflexa
- Estimulació del n. vagus
- Estimulació del n. frènic
- Modulació de la contracció cardiaca

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# Fibril.lació auricular

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

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

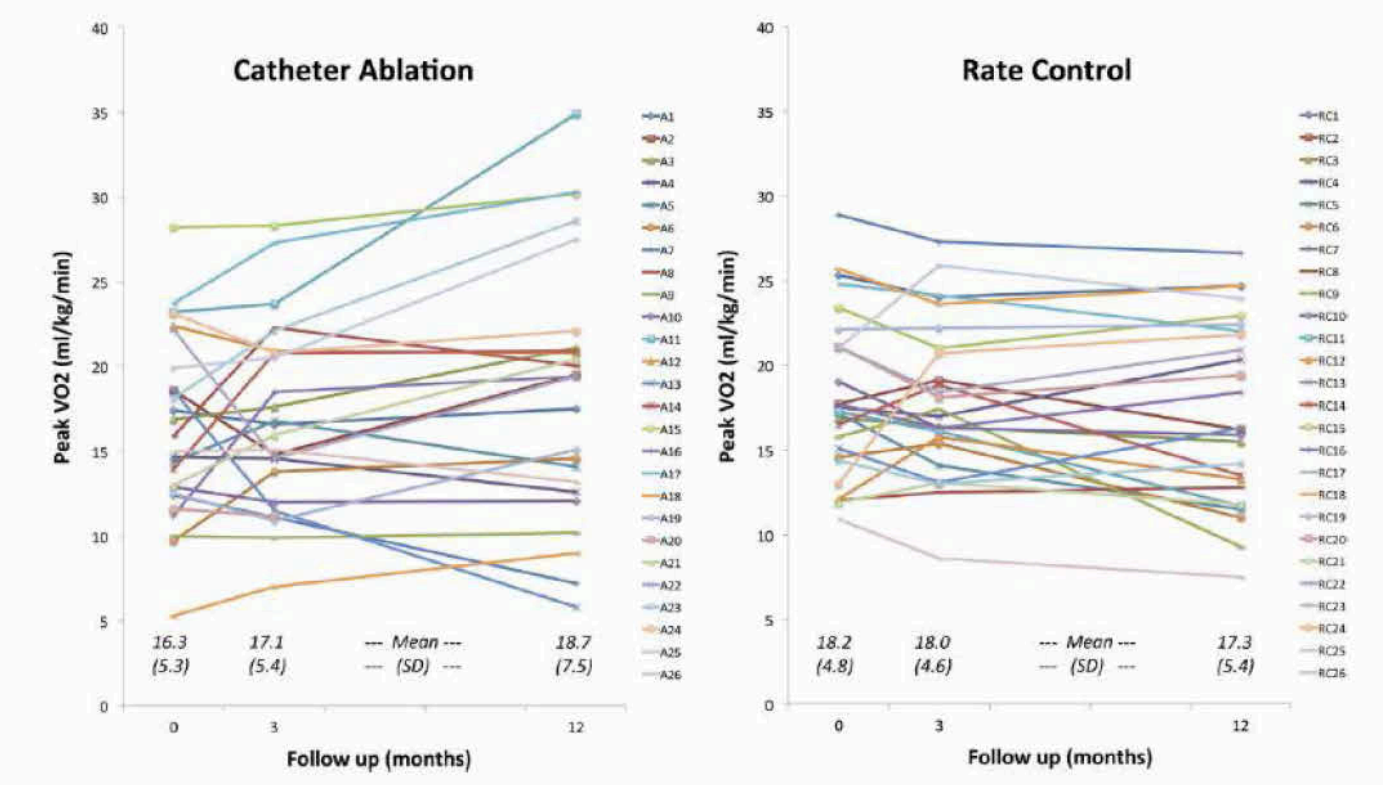
# Fibril.lació auricular

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

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

# A Randomized Trial to Assess Catheter Ablation Versus Rate Control in the Management of Persistent Atrial Fibrillation in Heart Failure

52 p, FA,  FEVE≤35%, CF NYHA II o III
Randomitzats a ablació de FA vs control FC
Ablació de FA. “Stepwise approach”: vvpp, línees sostre i istme mitral AE, “CAFEs”, ICT. Mapeig i ablacio TA




J Am Coll Cardiol 2013;61:1894–903

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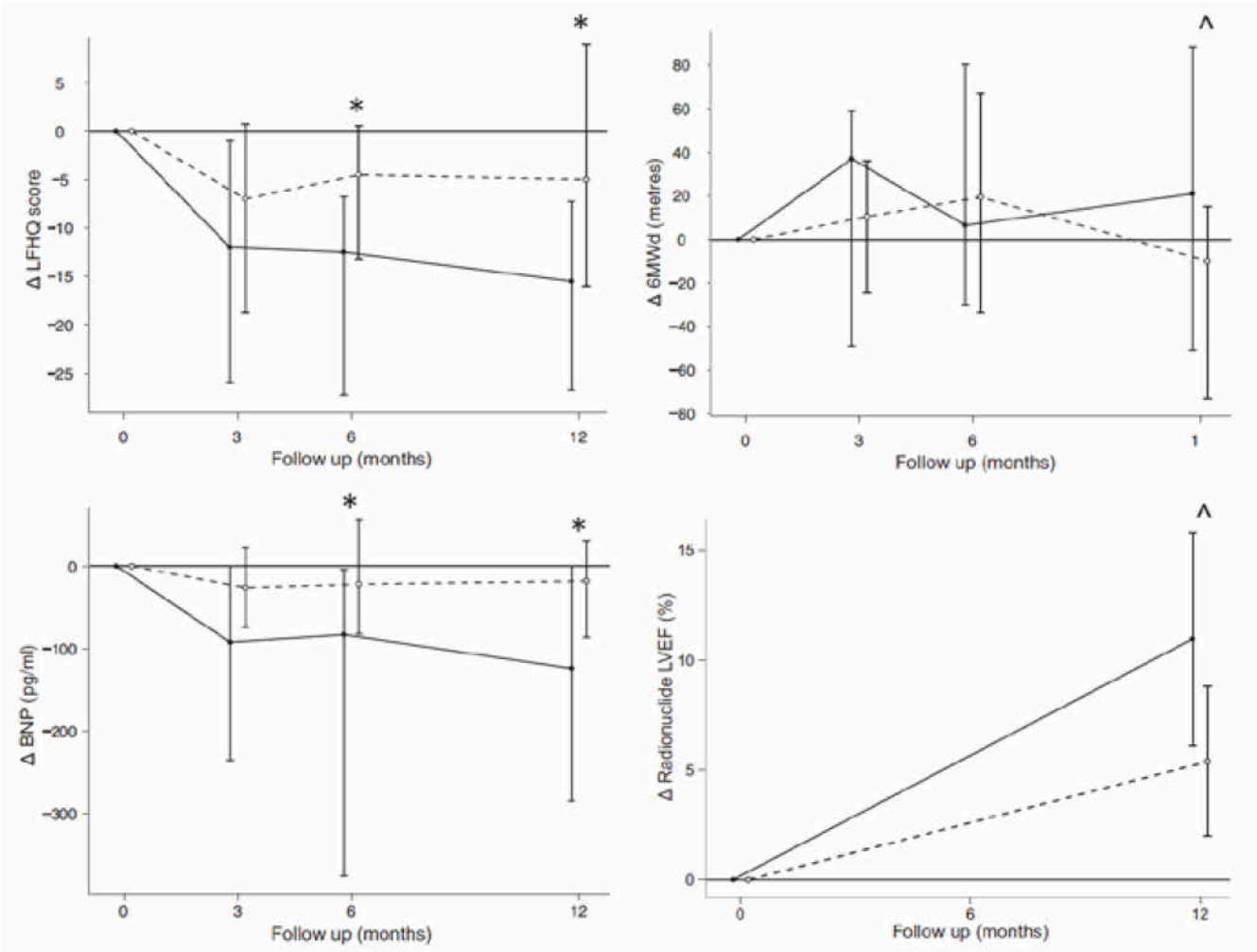


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  - Trasplantament cardiac

# Arítmies ventriculars

**Recommendations for the management of ventricular tachyarrhythmias in heart failure**

| Recommendations | Class [a] | Level [b] | Ref [c] |
|---|---|---|---|
| Potential aggravating/precipitating factors (e.g. low serum potassium/ magnesium, ongoing ischaemia) should be sought and corrected in patients with ventricular arrhythmias. | IIa | C | |
| Treatment with beta-blocker, MRA and sacubitril/valsartan reduces the risk of sudden death and is recommended for patients with HFrEF and ventricular arrhythmias (as for other patients)(see Section 7). | I | A | 162, 170–175 |
| Implantation of an ICD or CRT-D device is recommended for selected patients with HFrEF (see Section 8). | I | A | 223–226, 388 |
| Several strategies should be considered to reduce recurrent symptomatic arrhythmias in patients with an ICD (or in those who are not eligible for ICD), including attention to risk factors and optimal pharmacological treatment of HF, amiodarone, catheter ablation and CRT. | IIa | C | |
| Routine use of antiarrhythmic agents is not recommended in patients with HF and asymptomatic ventricular arrhythmias because of safety concerns (worsening HF, proarrhythmia, and death). | III | A | 247, 248, 364, 365 |

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# Bradiarítmies

**Recommendations for the management of bradyarrhythmias in heart failure**

| Recommendations | Class [a] | Level [b] | Ref [c] |
|---|---|---|---|
| When pauses >3 seconds are identified on the ECG, or if the bradycardia is symptomatic and the resting ventricular rate is <50 bpm in sinus rhythm or <60 bpm in AF, it should be considered whether there is need for any rate limiting medications prescribed; for patients in sinus rhythm beta-blockers should be reduced in dose or withdrawn only as a last resort. | IIa | C | |
| For patients with symptomatic, prolonged or frequent pauses despite adjustment of rate limiting medication, either beta-blocker withdrawal or pacing may be considered as the next step. | IIb | C | |
| Pacing solely to permit initiation or titration of beta-blocker therapy in the absence of a conventional pacing indication is not recommended. | III | C | |
| In patients with HFrEF who require pacing and who have high degree AV block, CRT rather than RV pacing is recommended. | I | A | 274, 275, 290 |
| In patients with HFrEF who require pacing who do not have high degree AV block, pacing modes that avoid inducing or exacerbating ventricular dyssynchrony should be considered. | IIa | C | |

BLOCK-HF

# Recomanacions

- Dispositius implantables
  - DAI
  - Resincronització cardiaca
  - Altres dispositius implantables
- Arítmies
  - Fibril.lació auricular
  - Arítmies ventriculars
  - Bradiarítmies
- Comorbilitats
  - Cardiopatia isquèmica
  - Patologia de la son
  - Patologia valvular
- Assistència ventricular i trasplantament cardiac
  - Assistència ventricular
  - Trasplantament cardiac

# Cardiopatia isquèmica

**Recommendations for the treatment of stable angina pectoris with symptomatic (NYHA Class II-IV) heart failure with reduced ejection fraction**[112,113]

| Recommendations | Class[a] | Level[b] | Ref[c] |
|---|---|---|---|
| **Step 1** | | | |
| A beta-blocker (in an evidence-based dose or maximum tolerated) is recommended as the preferred first-line treatment to relieve angina because of the associated benefits of this treatment (reducing the risk of HF hospitalization and the risk of premature death). | I | A | 167–173 |
| **Step 2: on top of beta-blocker or if a beta-blocker is not tolerated** | | | |
| Ivabradine should be considered as an anti-anginal drug in suitable HFrEF patients (sinus rhythm and HR ≥70 bpm) as per recommended HFrEF management. | IIa | B | 180, 410, 411 |
| **Step 3: For additional angina symptom relief – except from any combination not recommended** | | | |
| A short-acting oral or transcutaneous nitrate should be considered (effective anti-anginal treatment, safe in HF). | IIa | A | 183, 184, 409 |
| A long acting oral or transcutaneous nitrate should be considered (effective anti-anginal treatment, not extensively studied in HF). | IIa | B | 183, 184 |
| Trimetazidine may be considered when angina persists despite treatment with a beta-blocker (or alternative) to relieve angina (effective anti-anginal treatment, safe in HF). | IIb | A | 400–403 |
| Amlodipine may be considered in patients unable to tolerate a beta-blocker to relieve angina (effective anti-anginal treatment, safe in HF). | IIb | B | 215, 407 |
| Nicorandil may be considered in patients unable to tolerate a beta-blocker to relieve angina (effective anti-anginal treatment, but safety in HF uncertain). | IIb | C | |
| Ranolazine may be considered in patients unable to tolerate a beta-blocker to relieve angina (effective anti-anginal treatment, but safety in HF uncertain). | IIb | C | |
| **Step 4: Myocardial revascularization** | | | |
| Myocardial revascularization is recommended when angina persists despite treatment with anti-angina drugs. | I | A | 385, 412, 413 |
| Alternatives to myocardial revascularization: combination of ≥3 antianginal drugs (from those listed above) may be considered when angina persists despite treatment with beta-blocker, ivabradine and an extra anti-angina drug (excluding the combinations not recommended below). | IIb | C | |
| The following are NOT recommended: | | | |
| (1) Combination of any of ivabradine, ranolazine, and nicorandil because of unknown safety. | III | C | |
| (2) Combination of nicorandil and a nitrate (because of lack of additional efficacy). | III | C | |
| Diltiazem and verapamil are not recommended because of their negative inotropic action and risk of worsening HF. | III | C | 214 |

STICH

# Recomanacions

- Dispositius implantables
  - DAI
  - Resincronització cardíaca
  - Altres dispositius implantables
- Arítmies
  - Fibril.lació auricular
  - Arítmies ventriculars
  - Bradiarítmies
- Comorbilitats
  - Cardiopatia isquèmica
  - Patologia de la son
  - Patologia valvular
- Assistència ventricular i trasplantament cardíac
  - Assistència ventricular
  - Trasplantament cardiac

# Apnees centrals

**Treatments not recommended of other co-morbidities in patients with heart failure**

| Recommendations | Class [a] | Level [b] | Ref [c] |
|---|---|---|---|
| **Sleep apnoea** | | | |
| Adaptive servo-ventilation is not recommended in patients with HFrEF and a predominant central sleep apnoea because of an increased all-cause and cardiovascular mortality. | III | B | 473 |
| **Diabetes** | | | |
| Thiazolidinediones (glitazones) are not recommended in patients with HF, as they increase the risk of HF worsening and HF hospitalization. | III | A | 209, 210 |
| **Arthritis** | | | |
| NSAIDs or COX-2 inhibitors are not recommended in patients with HF, as they increase the risk of HF worsening and HF hospitalization. | III | B | 211–213 |

SERVE-HF

# Recomanacions

- Dispositius implantables
  - DAI
  - Resincronització cardíaca
  - Altres dispositius implantables
- Arítmies
  - Fibril.lació auricular
  - Arítmies ventriculars
  - Bradiarítmies
- Comorbilitats
  - Cardiopatia isquèmica
  - Patologia de la son
  - Patologia valvular
- Assistència ventricular i trasplantament cardíac
  - Assistència ventricular
  - Trasplantament cardíac

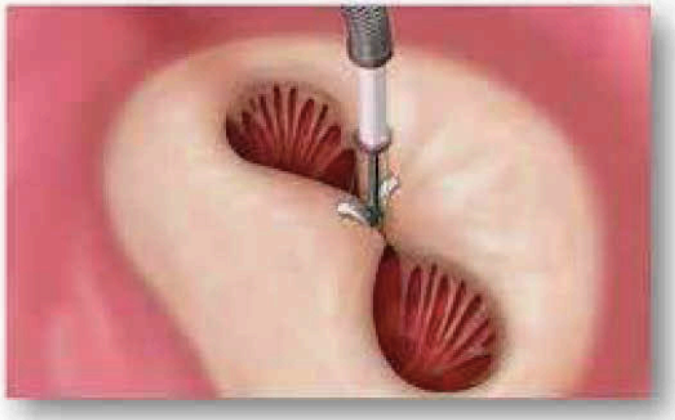
# Patologia valvular

**Recommendations for treatment of valvular diseases in patients with heart failure**

| Recommendations | Class [a] | Level [b] | Ref [c] |
|---|---|---|---|
| In symptomatic patients with reduced LVEF and 'low-flow, low-gradient' aortic stenosis (valve area <1 $cm^2$, LVEF <40%, mean pressure gradient <40 mmHg), low-dose dobutamine stress echocardiography should be considered to identify those with severe aortic stenosis suitable for valve replacement. | IIa | C | |
| TAVI is recommended in patients with severe aortic stenosis who are not suitable for surgery as assessed by a 'heart team' and have predicted post-TAVI survival >1 year. | I | B | 495, 496, 509 |
| TAVI should be considered in high-risk patients with severe aortic stenosis who may still be suitable for surgery, but in whom TAVI is favoured by a 'heart team' based on the individual risk profile and anatomic suitability. | IIa | A | 497, 498 |
| In patients with severe aortic regurgitation, aortic valve repair or replacement is recommended in all symptomatic patients and in asymptomatic patients with resting LVEF ≤50%, who are otherwise fit for surgery. | I | C | 317 |
| Evidence-based medical therapy in patients with HFrEF is recommended in order to reduce functional mitral regurgitation. | I | C | |
| Combined surgery of secondary mitral regurgitation and coronary artery bypass grafting should be considered in symptomatic patients with LV systolic dysfunction (LVEF <30%), requiring coronary revascularization for angina recalcitrant to medical therapy. | IIa | C | |
| Isolated surgery of non-ischaemic regurgitant mitral valve in patients with severe functional mitral regurgitation and severe LV systolic dysfunction (LVEF <30%) may be considered in selected patients in order to avoid or postpone transplantation. | IIb | C | |

# Mitraclip

In patients with HF with moderate-severe, secondary mitral regurgitation who are judged inoperable or at high surgical risk, percutaneous mitral valve intervention (percutaneous edge-to-edge repair) may be considered in order to improve symptoms and quality of life, although no RCT evidence of improvement has been published, only registry studies.[504–506]



Percutaneous Mitral Valve Edge-to-Edge Repair

In-Hospital Results and 1-Year Follow-Up of 628 Patients of the 2011–2012 Pilot European Sentinel Registry

JACC 2014

Meta-Analysis of the Usefulness of Mitraclip in Patients With Functional Mitral Regurgitation

Am J Cardiol 2015

One-year outcomes and predictors of mortality after MitraClip therapy in contemporary clinical practice: results from the German transcatheter mitral valve interventions registry

Eur Heart J 2016

Milloria grau insuficència mitral
Milloria CF NYHA
Milloria qualitat de vida

# Recomanacions

- Dispositius implantables
  - DAI
  - Resincronització cardiaca
  - Altres dispositius implantables
- Arítmies
  - Fibril.lació auricular
  - Arítmies ventriculars
  - Bradiarítmies
- Comorbilitats
  - Cardiopatia isquèmica
  - Patologia de la son
  - Patologia valvular
- Assistència ventricular i trasplantament cardiac
  - Assistència ventricular
  - Trasplantament cardiac

**Table 13.1 Terms describing various indications for mechanical circulatory support**

| | |
|---|---|
| **Bridge to decision (BTD)/ Bridge to bridge (BTB)** | Use of short-term MCS (e.g. ECLS or ECMO) in patients with cardiogenic shock until haemodynamics and end-organ perfusion are stabilized, contra-indications for long-term MCS are excluded (brain damage after resuscitation) and additional therapeutic options including long-term VAD therapy or heart transplant can be evaluated. |
| **Bridge to candidacy (BTC)** | Use of MCS (usually LVAD) to improve end-organ function in order to make an ineligible patient eligible for heart transplantation. |
| **Bridge to transplantation (BTT)** | Use of MCS (LVAD or BiVAD) to keep patient alive who is otherwise at high risk of death before transplantation until a donor organ becomes available. |
| **Bridge to recovery (BTR)** | Use of MCS (typically LVAD) to keep patient alive until cardiac function recovers sufficiently to remove MCS. |
| **Destination therapy (DT)** | Long-term use of MCS (LVAD) as an alternative to transplantation in patients with end-stage HF ineligible for transplantation or long-term waiting for heart transplantation. |

**Table 13.3** Patients potentially eligible for implantation of a left ventricular assist device

| Patients with >2 months of severe symptoms despite optimal medical and device therapy and more than one of the following: |
|---|
| LVEF <25% and, if measured, peak $VO_2$ <12 mL/kg/min. |
| ≥3 HF hospitalizations in previous 12 months without an obvious precipitating cause. |
| Dependence on i.v. inotropic therapy. |
| Progressive end-organ dysfunction (worsening renal and/or hepatic function) due to reduced perfusion and not to inadequate ventricular filling pressure (PCWP ≥20 mmHg and SBP ≤80–90 mmHg or CI ≤2 L/min/$m^2$). |
| Absence of severe right ventricular dysfunction together with severe tricuspid regurgitation. |

**Recommendations for implantation of mechanical circulatory support in patients with refractory heart failure**

| Recommendations | Class [a] | Level [b] | Ref [c] |
|---|---|---|---|
| An LVAD should be considered in patients who have end- stage HFrEF despite optimal medical and device therapy and who are eligible for heart transplantation in order to improve symptoms, reduce the risk of HF hospitalization and the risk of premature death (Bridge to transplant indication). | IIa | C | |
| An LVAD should be considered in patients who have end-stage HFrEF despite optimal medical and device therapy and who are not eligible for heart transplantation to, reduce the risk of premature death. | IIa | B | 605, 612, 613 |

# Recomanacions

- Dispositius implantables
  - DAI
  - Resincronització cardíaca
  - Altres dispositius implantables
- Arítmies
  - Fibril.lació auricular
  - Arítmies ventriculars
  - Bradiarítmies
- Comorbilitats
  - Cardiopatia isquèmica
  - Patologia de la son
  - Patologia valvular
- Assistència ventricular i trasplantament cardíac
  - Assistència ventricular
  - Trasplantament cardíac

## Table 13.4 Heart transplantation: indications and contra-indications

| | |
|---|---|
| **Patients to consider** | End-stage HF with severe symptoms, a poor prognosis, and no remaining alternative treatment options.<br>Motivated, well informed, and emotionally stable.<br>Capable of complying with the intensive treatment required postoperatively. |
| **Contra-indications** | Active infection.<br>Severe peripheral arterial or cerebrovascular disease.<br>Pharmacologically irreversible pulmonary hypertension (LVAD should be considered with a subsequent re-evaluation to establish candidacy).<br>Cancer (a collaboration with oncology specialists should occur to stratify each patient as to their risk of tumour recurrence).<br>Irreversible renal dysfunction (e.g. creatinine clearance <30 mL/min).<br>Systemic disease with multi-organ involvement.<br>Other serious co-morbidity with poor prognosis.<br>Pre-transplant BMI >35 $kg/m^2$ (weight loss is recommended to achieve a BMI <35 $kg/m^2$).<br>Current alcohol or drug abuse.<br>Any patient for whom social supports are deemed insufficient to achieve compliant care in the outpatient setting. |