



SESSIONS D'ACTUALITZACIÓ EN CARDIOLOGIA

Curs 2016-2017. Primers dilluns de mes

12 de desembre del 2016

**Recomanacions en el tractament no
farmacològic de la insuficiència cardíaca.
Discussió.**

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Badalona



Recommendations for the use of implanted cardioverter defibrillators in patients with heart failure

2012

2016

Recommendations	Class ^a	Level ^b	Ref ^c
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Recommendations for implantable cardioverter-defibrillator in patients with heart failure

Recommendations	Class ^a	Level ^b	Ref ^c
<p>Secondary prevention</p> <p>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.</p>	I	A	223–226
<p>Primary prevention</p> <p>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:</p> <ul style="list-style-type: none"> • IHD (unless they have had an MI in the prior 40 days – see below). 	I	A	149, 156, 227
<ul style="list-style-type: none"> • 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

myocardial infarction	I	B	149
(ii) Non-ischaemic aetiology	I	B	149

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Defibrillator Implantation in Patients with Nonischemic
Systolic Heart Failure

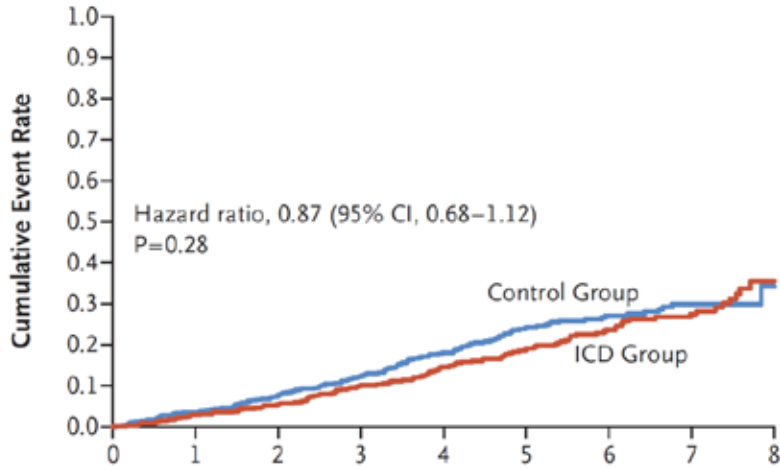
CONCLUSIONS

In this trial, prophylactic ICD implantation in patients with symptomatic systolic heart failure not caused by coronary artery disease was not associated with a significantly lower long-term rate of death from any cause than was usual clinical care. (Funded by Medtronic and others; DANISH ClinicalTrials.gov number, NCT00542945.)

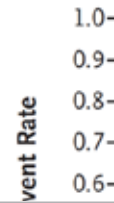
556 ICD vs. 560 control
Follow-up 67.6 months

New Engl J Med 2016; 375:1221

A Death from Any Cause



C Sudden Cardiac Death



Subgroup	ICD Group <i>no. of events/total no.</i>	Control Group <i>no. of events/total no.</i>	Hazard Ratio (95% CI)	P Value	P Value for Interaction
Age					0.009
<59 yr	17/167	34/181	0.51 (0.29-0.92)	0.02	
≥59 to <68 yr	36/173	50/202	0.75 (0.48-1.16)	0.19	
≥68 yr	67/216	47/177	1.19 (0.81-1.73)	0.38	



No. at Risk

	560	540	517	438	344	248	169	88	12
Control Group									
ICD Group	556	540	526	451	358	272	186	107	17

S'haurien de modificar ja les *Guidelines*?

2016

Recommendations for implantable cardioverter-defibrillator in patients with heart failure

Recommendations	Class ^a	Level ^b	Ref ^c
Secondary prevention 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 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: <ul style="list-style-type: none"> • IHD (unless they have had an MI in the prior 40 days – see below). • DCM. 	I	A	149, 156, 227
	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

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 $\leq 35\%$ despite OMT in order to improve symptoms and reduce morbidity and mortality.	I	A	261–272
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 $\leq 35\%$ 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 $\leq 35\%$ 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 $\leq 35\%$ 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
CRT should be considered for patients with LVEF $\leq 35\%$ 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

Recommendations 2012

Recommendations	Class ^a	Level ^b	Ref ^c
LBBB QRS morphology CRT-P/CRT-D is recommended in patients in sinus rhythm with a QRS duration of ≥ 120 ms, LBBB QRS morphology, and an EF $\leq 35\%$, who are expected to survive with good functional status for >1 year, to reduce the risk of HF hospitalization and the risk of premature death.	I	A	156, 157

10.1 Atrial fibrillation

2016

2012

Recommendations for a rhythm control-management strategy in patients with AF, symptomatic HF (NYHA functional class II–IV), and LV 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 optimum pharmacological treatment and adequate control of the ventricular rate, to improve clinical/symptomatic status.	IIb	C	–
Amiodarone may be considered prior to (and following) successful electrical cardioversion to maintain sinus rhythm.	IIb	C	–
Dronedaron is not recommended because of an increased risk of hospital admissions for cardiovascular causes and an increased risk of premature death.	III	A	176, 177
Class I antiarrhythmic agents are not recommended because of an increased risk of premature death.	III	A	178

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
Dronedaron 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

10.3 Symptomatic bradycardia, pauses and atrio-ventricular block

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	

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

Table 11.1 Importance of co-morbidities in patients with heart failure

1. interfere with the diagnostic process of HF (e.g. COPD as a potentially confounding cause of dyspnoea). ^{390, 391}
2. aggravate HF symptoms and further impair quality of life. ^{391, 392}
3. contribute to the burden of hospitalizations and mortality, ³⁹³ as the main cause of readmissions at 1 and 3 months. ³⁹⁴
4. may affect the use of treatments for HF (e.g. renin-angiotensin system inhibitors contra-indicated in some patients with severe renal dysfunction or beta-blockers relatively contra-indicated in asthma). ^{395, 396}
5. evidence base for HF treatment is more limited as co-morbidities were mostly an exclusion criterion in trials; efficacy and safety of interventions is therefore often lacking in the presence of co-morbidities.
6. drugs used to treat co-morbidities may cause worsening HF (e.g. NSAIDs given for arthritis, some anti-cancer drugs). ³⁹⁷
7. interaction between drugs used to treat HF and those used to treat co-morbidities, resulting in lower efficacy, poorer safety, and the occurrence of side effects (e.g. beta-blockers for HFrEF and beta-agonists for COPD and asthma). ^{391, 395, 396}

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11. Co-morbidities

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

Recommendations for the treatment of other co-morbidities in patients with heart failure

Recommendations	Class ^a	Level ^b	Ref ^c
Iron deficiency			
Intravenous FCM should be considered in symptomatic patients with HFrEF and iron deficiency (serum ferritin <100 µg/L, or ferritin between 100–299 µg/L and transferrin saturation <20%) in order to alleviate HF symptoms, and improve exercise capacity and quality of life.	IIa	A	469, 470
Diabetes			
Metformin should be considered as a first-line treatment of glycaemic control in patients with diabetes and HF, unless contra-indicated.	IIa	C	440, 441

2012

11.16 Obesity

Obesity should be managed as recommended in other guidelines.²¹⁰

2016

11.15 Obesity

Although obesity is an independent risk factor for developing HF, once HF is diagnosed, it is well established that obesity is associated with lower mortality across a wide range of body mass indexes (BMIs)...—the so-called obesity paradox also seen in other chronic illnesses.^{414,416}

...although often recommended for symptom benefit and risk factor control, weight loss as an intervention has never been prospectively shown to be either beneficial or safe in HFrEF.

... In patients with HF with moderate degrees of obesity (BMI <35 kg/m²), weight loss cannot be recommended. In more advanced obesity (BMI 35–45 kg/m²), weight loss may be considered to manage symptoms and exercise capacity.

2012

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2016

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13. Mechanical circulatory support and heart transplantation

Table 13.2 INTERMACS (Interagency Registry for Mechanically Assisted Circulatory Support) stages for classifying patients with advanced heart failure

INTERMACS level	NYHA Class	Description	Device	1y survival with LVAD therapy
1. Cardiogenic shock "Crash and burn"	IV	Haemodynamic instability in spite of increasing doses of catecholamines and/or mechanical circulatory support with critical hypoperfusion of target organs (severe cardiogenic shock).	ECLS, ECMO, percutaneous support devices	52.6±5.6%
2. Progressive decline despite inotropic support "Sliding on inotropes"	IV	Intravenous inotropic support with acceptable blood pressure but rapid deterioration of renal function, nutritional state, or signs of congestion.	ECLS, ECMO, LVAD	63.1±3.1%
3. Stable but inotrope dependent "Dependent stability"	IV	Haemodynamic stability with low or intermediate doses of inotropics, but necessary due to hypotension, worsening of symptoms, or progressive renal failure.	LVAD	78.4±2.5%
4. Resting symptoms "Frequent flyer"	IV ambulatory	Temporary cessation of inotropic treatment is possible, but patient presents with frequent symptom recurrences and typically with fluid overload.	LVAD	78.7±3.0%
5. Exertion intolerant "Housebound"	IV ambulatory	Complete cessation of physical activity, stable at rest, but frequently with moderate fluid retention and some level of renal dysfunction.	LVAD	93.0±3.9% ^a
6. Exertion limited "Walking wounded"	III	Minor limitation on physical activity and absence of congestion while at rest. Easily fatigued by light activity.	LVAD / Discuss LVAD as option	-
7. "Placeholder"	III	Patient in NYHA Class III with no current or recent unstable fluid balance.	Discuss LVAD as option	-

13.1 Mechanical circulatory support

13.1.2 Mechanical circulatory support in end-stage chronic heart failure

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/m²).

Absence of severe right ventricular dysfunction together with severe tricuspid regurgitation.

2012

Recommendations for surgical implantation of LVADs in patients with systolic heart failure

Recommendations	Class ^a	Level ^b	Ref ^c
An LVAD or BiVAD is recommended in selected patients ^d with end-stage HF despite optimal pharmacological and device treatment and who are otherwise suitable for heart transplantation, to improve symptoms and reduce the risk of HF hospitalization for worsening HF and to reduce the risk of premature death while awaiting transplantation.	I	B	254, 255, 258
An LVAD should be considered in highly selected patients ^d who have end-stage HF despite optimal pharmacological and device therapy and who are not suitable for heart transplantation, but are expected to survive >1 year with good functional status, to improve symptoms, and reduce the risk of HF hospitalization and of premature death.	IIa	B	254

2016

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 HF _{rEF} 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 HF _{rEF} 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



2012

Table 23 Heart transplantation: indications and contraindications

Patients to consider	End-stage heart failure with severe symptoms, a poor prognosis, and no remaining alternative treatment options
	Motivated, well informed, and emotionally stable
	Capable of complying with the intensive treatment required post-operatively
Contraindications	Active infection
	Severe peripheral arterial or cerebrovascular disease
	Current alcohol or drug abuse
	Treated cancer in previous 5 years
	Unhealed peptic ulcer
	Recent thrombo-embolism
	Significant renal failure (e.g. creatinine clearance <50 mL/min)
	Significant liver disease
	Systemic disease with multiorgan involvement
	Other serious co-morbidity with poor prognosis
	Emotional instability or untreated mental illness
	High, fixed pulmonary vascular resistance (>4–5 Wood Units and mean transpulmonary gradient >15 mmHg)

2016

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. Motivated, well informed, and emotionally stable. Capable of complying with the intensive treatment required postoperatively.
Contra-indications	Active infection. Severe peripheral arterial or cerebrovascular disease. Pharmacologically irreversible pulmonary hypertension (LVAD should be considered with a subsequent re-evaluation to establish candidacy).
	Cancer (a collaboration with oncology specialists should occur to stratify each patient as to their risk of

It needs to be considered that some contraindications are transient and treatable. While an active infection remains a relative contraindication to heart transplantation, patients with HIV, hepatitis, Chagas disease and tuberculosis can be considered as suitable candidates provided certain strict management principles are adhered to by the teams.

2012

14. Holistic management, including exercise training and multidisciplinary management programmes, patient monitoring, and palliative care

Recommendations for exercise prescription and multidisciplinary management

Recommendations	Class ^a	Level ^b	Ref ^c
It is recommended that regular aerobic exercise is encouraged in patients with heart failure to improve functional capacity and symptoms.	I	A	262, 263
It is recommended that patients with heart failure are enrolled in a multidisciplinary-care management programme to reduce the risk of heart failure hospitalization.	I	A	236, 259, 264

14. Multidisciplinary team management 2016

Recommendations for exercise, multidisciplinary management and monitoring of patients with heart failure

Recommendations	Class ^a	Level ^b	Ref ^c
It is recommended that regular aerobic exercise is encouraged in patients with HF to improve functional capacity and symptoms.	I	A	321, 618-621
It is recommended that regular aerobic exercise is encouraged in stable patients with HFrEF to reduce the risk of HF hospitalization.	I	A	618, 619
It is recommended that patients with HF are enrolled in a multidisciplinary care management programme to reduce the risk of HF hospitalization and mortality.	I	A	622-625
Referral to primary care for long-term follow-up may be considered for stable HF patients who are on optimal therapy to monitor for effectiveness of treatment, disease progression and patient adherence.	IIb	B	626, 627
Monitoring of pulmonary artery pressures using a wireless implantable haemodynamic monitoring system (CardioMems) may be considered in symptomatic patients with HF with previous HF hospitalization in order to reduce the risk of recurrent HF hospitalization.	IIb	B	628, 629
Multiparameter monitoring based on ICD (IN-TIME approach) may be considered in symptomatic patients with HFrEF (LVEF ≤35%) in order to improve clinical outcomes.	IIb	B	630

Table 27 Essential topics that should be covered during patient education, and the skills and self-care behaviours that should be taught in relation to these topics.

Educational topic	Patient skills and self-care behaviours
Definition and aetiology	<ul style="list-style-type: none"> Understand the cause of heart failure and why symptoms occur
Prognosis	<ul style="list-style-type: none"> Understand important prognostic factors and make realistic decisions
Symptom monitoring and self-care	<ul style="list-style-type: none"> Monitor and recognize signs and symptoms Record daily weight and recognize rapid weight gain Know how and when to notify healthcare provider In the case of increasing dyspnoea or oedema or a sudden unexpected weight gain of >2 kg in 3 days, patients may increase their diuretic dose and/or alert their healthcare team Use flexible diuretic therapy if appropriate and recommended after appropriate education and provision of detailed instructions
Pharmacological treatment	<ul style="list-style-type: none"> Understand indications, dosing, and effects of drugs Recognize the common side effects of each drug prescribed
Adherence	<ul style="list-style-type: none"> Understand the importance of following treatment recommendations and maintaining motivation to follow treatment plan Sodium restriction may help control the symptoms and signs of congestion in patients with symptomatic heart failure classes III and IV
Diet	<ul style="list-style-type: none"> Avoid excessive fluid intake: fluid restriction of 1.5–2 L/day may be considered in patients with severe heart failure to relieve symptoms and congestion. Restriction of hypotonic fluids may improve hyponatraemia. Routine fluid restriction in all patients with mild to moderate symptoms is probably not of benefit. Weight-based fluid restriction (30 mL/kg body weight, 35 mL/kg if body weight >85 kg) may cause less thirst Monitor and prevent malnutrition Eat healthily and keep a healthy weight (see Section 11)
Alcohol	<ul style="list-style-type: none"> Modest intake of alcohol: abstinence is recommended in patients with alcohol-induced cardiomyopathy. Otherwise, normal alcohol guidelines apply (2 units per day in men or 1 unit per day in women). 1 unit is 10 mL of pure alcohol (e.g. 1 glass of wine, 1/2 pint of beer, 1 measure of spirit)
Smoking and drugs	<ul style="list-style-type: none"> Stop smoking and/or taking illicit drugs
Exercise	<ul style="list-style-type: none"> Understand the benefits of exercise Perform exercise training regularly Be reassured and comfortable about physical activity
Travel and leisure	<ul style="list-style-type: none"> Prepare travel and leisure activities according to physical capacity When travelling, carry a written report of medical history and current medication regimen and carry extra medication. Monitor and adapt fluid intake particularly during flights and in hot climates. Beware adverse reactions to sun exposure with certain medications (e.g. amiodarone)
Sexual activity	<ul style="list-style-type: none"> Be reassured about engaging in sex and discuss problems with healthcare professionals. Stable patients can undertake normal sexual activity that does not provoke undue symptoms. For treatment of erectile dysfunction, see Section 11.10
Immunization	<ul style="list-style-type: none"> Receive immunization against influenza and pneumococcal disease according to local guidelines and practice
Sleep and breathing disorders	<ul style="list-style-type: none"> Recognize preventive behaviour such as reducing weight in obese patients, smoking cessation, and abstinence from alcohol Learn about treatment options if appropriate
Psychosocial aspects	<ul style="list-style-type: none"> Understand that depressive symptoms and cognitive dysfunction are common in patients with heart failure and the importance of social support Learn about treatment options if appropriate

Table 14.2 Key topics and self-care skills to include in patient education and the professional behaviours to optimize learning and facilitate shared decision making

Education topic	Patient skills	Professional behaviours
Definition, aetiology and trajectory of HF (including prognosis).	<ul style="list-style-type: none"> Understand the cause of HF, symptoms and disease trajectory. Make realistic decisions including decisions about treatment at end-of-life. 	<ul style="list-style-type: none"> Provide oral and written information that takes account of educational grade and health literacy. Recognize HF disease barriers to communication and provide information at regular time intervals. Sensitively communicate information on prognosis at time of diagnosis, during decision making about treatment options, when there is a change in the clinical condition and whenever the patient requests.
Symptom monitoring and self-care.	<ul style="list-style-type: none"> Monitor and recognize change in signs and symptoms. Know how and when to contact a healthcare professional. In line with professional advice, know when to self-manage diuretic therapy and fluid intake. 	<ul style="list-style-type: none"> Provide individualized information to support self-management such as: <ul style="list-style-type: none"> ⇒ In the case of increasing dyspnoea or oedema or a sudden unexpected weight gain of >2 kg in 3 days, patients may increase their diuretic dose and/or alert their healthcare team. ⇒ Use of flexible diuretic regime. ⇒ Self-care support aids such as dosette box when appropriate.
Pharmacological treatment.	<ul style="list-style-type: none"> Understand the indications, dosing and side effects of drugs. Recognize the common side effects and know when to notify a healthcare professional. Recognize the benefits of taking medication as prescribed. 	<ul style="list-style-type: none"> Provide written and oral information on dosing, effects and side effects (see web tables 7.4–7.8 – practical guidance on use of pharmacological agents).
Implanted devices and percutaneous/surgical interventions.	<ul style="list-style-type: none"> Understand the indications and aims of procedures/implanted devices. Recognize the common complications and know when to notify a healthcare professional. Recognize the importance and benefits of procedures/implanted devices. 	<ul style="list-style-type: none"> Provide written and oral information on benefits and side effects. Provide written and oral information on regular control of device functioning, along with documentation of regular check-up.
Immunization	<ul style="list-style-type: none"> Receive immunization against influenza and pneumococcal disease 	<ul style="list-style-type: none"> Advise on local guidance and immunization practice.
Diet and alcohol	<ul style="list-style-type: none"> Avoid excessive fluid intake. Recognize need for altered fluid intake such as: <ul style="list-style-type: none"> ⇒ Increase intake during periods of high heat and humidity, nausea/vomiting ⇒ Fluid restriction of 1.5–2 L/day may be considered in patients with severe HF to relieve symptoms and congestion. Monitor body weight and prevent malnutrition. Eat healthily, avoid excessive salt intake (>6 g/day) and maintain a healthy body weight. Abstain from or avoid excessive alcohol intake, especially for alcohol induced cardiomyopathy. 	<ul style="list-style-type: none"> Individualize information on fluid intake to take into account body weight and periods of high heat and humidity. Adjust advice during periods of acute decompensation and consider altering these restrictions towards end-of-life. Tailor alcohol advice to aetiology of HF; e.g. abstinence in alcoholic cardiomyopathy. Normal alcohol guidelines apply (2 units per day in men or 1 unit per day in women). 1 unit is 10 mL of pure alcohol (e.g. 1 glass of wine, 1/2 pint of beer, 1 measure of spirit). For management of obesity (see Section 11.15).

Education topic	Patient skills	Professional behaviours
Smoking and recreational substance use.	<ul style="list-style-type: none"> • Stop smoking and taking recreational substances. 	<ul style="list-style-type: none"> • Refer for specialist advice for smoking cessation and drug withdrawal and replacement therapy. • Consider referral for cognitive behavioural theory and psychological support if patient wishes support to stop smoking.
Exercise	<ul style="list-style-type: none"> • Undertake regular exercise sufficient to provoke mild or moderate breathlessness. 	<ul style="list-style-type: none"> • Advice on exercise that recognizes physical and functional limitations, such as frailty, comorbidities. • Referral to exercise programme when appropriate.
Travel and leisure	<ul style="list-style-type: none"> • Prepare travel and leisure activities according to physical capacity. • Monitor and adapt fluid intake according to humidity (flights and humid climates). • Be aware of adverse reactions to sun exposure with certain medication (such as amiodarone). • Consider effect of high altitude on oxygenation. • take medicine in cabin luggage in the plane, have a list with you of treatments and the dosage with the generic name. 	<ul style="list-style-type: none"> • Refer to local country specific driving regulations regarding ICD. • Provide advice regarding flight security devices in presence of ICD.
Sleep and breathing (see co-morbidities Section 11.16).	<ul style="list-style-type: none"> • Recognize problems with sleeping, their relationship with HF and how to optimize sleep. 	<ul style="list-style-type: none"> • Provide advice such as timing of diuretics, environment for sleep, device support. • In presence of sleep-disordered breathing provide advice on weight reduction/control.
Sexual activity (see co-morbidities Section 11.7).	<ul style="list-style-type: none"> • Be reassured about engaging in sex, provided sexual activity does not provoke undue symptoms. • Recognize problems with sexual activity, their relationship with HF and applied treatment and how to treat erectile dysfunction. 	<ul style="list-style-type: none"> • Provide advice on eliminating factors predisposing to erectile dysfunction and available pharmacological treatment of erectile dysfunction. • Refer to specialist for sexual counselling when necessary.
Psychosocial aspects	<ul style="list-style-type: none"> • Understand that depressive symptoms and cognitive dysfunction are found more frequently in people with HF, and that they may affect adherence. • Recognize psychological problems which may occur in the course of disease, in relation to changed lifestyle, pharmacotherapy, implanted devices and other procedures (including mechanical support and heart transplantation). 	<ul style="list-style-type: none"> • Regularly communicate information on disease, treatment options and self-management. • Involve family and carers in HF management and self-care. • Refer to specialist for psychological support when necessary.

15. Gaps in evidence

4. Devices and interventions

- Indications for ICDs in specific subgroups (e.g. ARVC and HFmrEF/HFpEF) and optimal selection of ICD candidates
- QRS morphology or duration as a predictor of response to CRT
- CRT in patients with AF
- Efficacy of PV ablation as a rhythm-control strategy in patients with AF
- Interventional approach to recurrent, life-threatening ventricular tachyarrhythmias
- The role of remote monitoring strategies in HF
- Non-surgical (percutaneous) correction of functional mitral and tricuspid regurgitations
- Identification of indications for coronary angiography/revascularization in patients with HF and chronic stable CAD
- Effects of novel LVADs as destination therapy and bridge to transplantation

16. To do and not to do messages from the Guidelines

Recommendations for implantable cardioverter-defibrillator in patients with heart failure	Class^a	Level^b
Secondary prevention 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
Primary prevention 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 1 year with good functional status, and they have: <ul style="list-style-type: none"> • IHD (unless they have had an MI in the prior 40 days) • DCM 	I	A B
ICD implantation is not recommended within 40 days of an MI as implantation at this time does not improve prognosis.	III	A
Recommendations for cardiac resynchronization therapy implantation in patients with heart failure	Class^a	Level^b
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
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
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 atrial fibrillation (see Section 10.1).	I	A
CRT is contra-indicated in patients with a QRS duration <130 msec	III	A
Not-recommended treatments of co-morbidities in patients with heart failure	Class^a	Level^b
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
Recommendations for exercise, multidisciplinary management, and monitoring of patients with heart failure	Class^a	Level^b
It is recommended that regular aerobic exercise is encouraged in patients with HF to improve functional capacity and symptoms.	I	A
It is recommended that regular aerobic exercise is encouraged in stable patients with HFrEF to reduce the risk of HF hospitalization.	I	A
It is recommended that patients with HF are enrolled in a multidisciplinary care management programme to reduce the risk of HF hospitalization and mortality.	I	A



SESSIONS D'ACTUALITZACIÓ EN CARDIOLOGIA

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12. Acute heart failure

Recommendations for the management of patients with acute heart failure: oxygen therapy and ventilatory support

Recommendations	Class ^a	Level ^b	Ref ^c
Monitoring of transcutaneous arterial oxygen saturation (SpO ₂) is recommended.	I	C	
Measurement of blood pH and carbon dioxide tension (possibly including lactate) should be considered, especially in patients with acute pulmonary oedema or previous history of COPD using venous blood. In patients with cardiogenic shock arterial blood is preferable.	IIa	C	
Oxygen therapy is recommended in patients with AHF and SpO ₂ <90% or PaO ₂ <60 mmHg (8.0 kPa) to correct hypoxaemia.	I	C	
Non-invasive positive pressure ventilation (CPAP, BiPAP) should be considered in patients with respiratory distress (respiratory rate >25 breaths/min, SpO ₂ <90%) and started as soon as possible in order to decrease respiratory distress and reduce the rate of mechanical endotracheal intubation. Non-invasive positive pressure ventilation can reduce blood pressure and should be used with caution in hypotensive patients. Blood pressure should be monitored regularly when this treatment is used.	IIa	B	541–545
Intubation is recommended, if respiratory failure, leading to hypoxaemia (PaO ₂ <60 mmHg (8.0 kPa)), hypercapnia (PaCO ₂ >50 mmHg (6.65 kPa)) and acidosis (pH <7.35), cannot be managed non-invasively.	I	C	

Recommendations regarding renal replacement therapy in patients with acute heart failure

Recommendations	Class ^a	Level ^b	Ref ^c
Ultrafiltration may be considered for patients with refractory congestion, who failed to respond to diuretic-based strategies.	IIb	B	578–580
Renal replacement therapy should be considered in patients with refractory volume overload and acute kidney injury.	IIa	C	

12. Acute heart failure

Recommendations regarding management of patients with cardiogenic shock

Recommendations	Class ^a	Level ^b	Ref ^c
In all patients with suspected cardiogenic shock, immediate ECG and echocardiography are recommended.	I	C	
All patients with cardiogenic shock should be rapidly transferred to a tertiary care center which has a 24/7 service of cardiac catheterization, and a dedicated ICU/CCU with availability of short-term mechanical circulatory support.	I	C	
In patients with cardiogenic shock complicating ACS an immediate coronary angiography is recommended (within 2 hours from hospital admission) with an intent to perform coronary revascularization.	I	C	
Continuous ECG and blood pressure monitoring are recommended.	I	C	
Invasive monitoring with an arterial line is recommended.	I	C	
Fluid challenge (saline or Ringer's lactate, >200 ml/15–30 min) is recommended as the first-line treatment if there is no sign of overt fluid overload.	I	C	
Intravenous inotropic agents (dobutamine) may be considered to increase cardiac output.	IIb	C	
Vasopressors (norepinephrine preferable over dopamine) may be considered if there is a need to maintain SBP in the presence of persistent hypoperfusion.	IIb	B	558
IABP is not routinely recommended in cardiogenic shock.	III	B	585, 586
Short-term mechanical circulatory support may be considered in refractory cardiogenic shock depending on patient age, comorbidities and neurological function.	IIb	C	

13.1 Mechanical circulatory support

13.1.1 Mechanical circulatory support in acute heart failure

To manage patients with AHF or cardiogenic shock (INTERMACS level 1), short-term mechanical support systems, including percutaneous cardiac support devices, extracorporeal life support (ECLS) and extracorporeal membrane oxygenation (ECMO) may be used to support patients with left or biventricular failure until cardiac and other organ function have recovered.

In addition, MCS systems, particularly ECLS and ECMO, can be used as a 'bridge to decision' (BTD) in patients with acute and rapidly deteriorating HF or cardiogenic shock to stabilize haemodynamics, recover end-organ function and allow for a full clinical evaluation for the possibility of either heart transplant or a more durable MCS device.

... Based on these results, temporary percutaneous MCS cannot be recommended as a proven or efficacious treatment for acute cardiogenic shock. In selected patients it may serve as a bridge to definite therapy.

IIb C