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ESC GUIDELINES

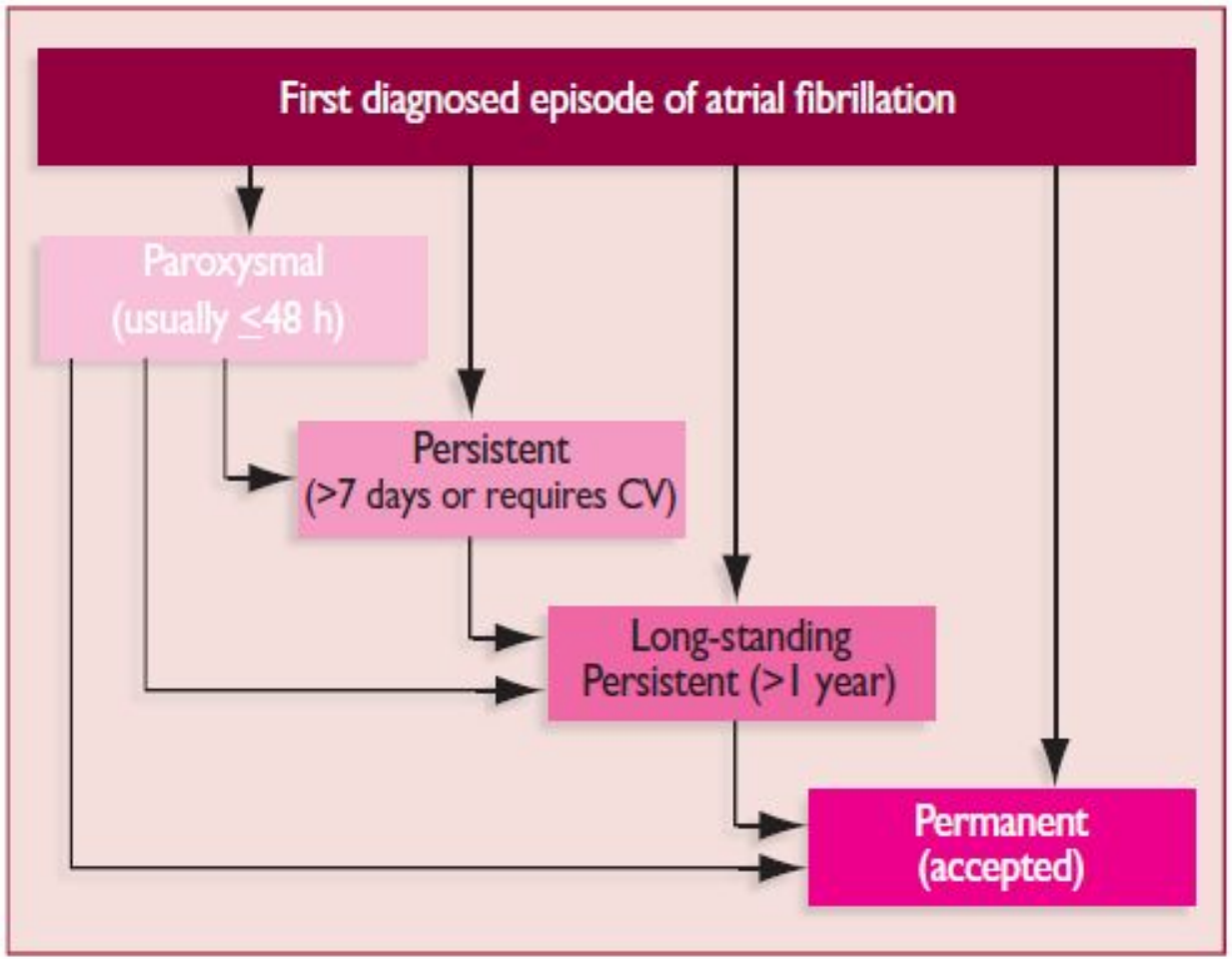
Guidelines for the management of atrial fibrillation

The Task Force for the Management of Atrial Fibrillation of the European Society of Cardiology (ESC)

Developed with the special contribution of the European Heart Rhythm Association (EHRA)†

Endorsed by the European Association for Cardio-Thoracic Surgery (EACTS)

Authors/Task Force Members: A. John Camm (Chairperson) (UK)*, Paulus Kirchhof (Germany), Gregory Y. H. Lip (UK), Ulrich Schotten (The Netherlands), Irene Savelieva (UK), Sabine Ernst (UK), Isabelle C. Van Gelder (The Netherlands), Nawwar Al-Attar (France), Gerhard Hindricks (Germany), Bernard Prendergast (UK), Hein Heidbuchel (Belgium), Ottavio Alfieri (Italy), Annalisa Angelini (Italy), Dan Atar (Norway), Paolo Colonna (Italy), Raffaele De Caterina (Italy), Johan De Sutter (Belgium), Andreas Goette (Germany), Bulent Gorenek (Turkey), Magnus Heldal (Norway), Stefan H. Hohloser (Germany), Philippe Kolh (Belgium), Jean-Yves Le Heuzey (France), Piotr Ponikowski (Poland), Frans H. Rutten (The Netherlands).


First diagnosed episode of atrial fibrillation
Paroxysmal
(usually ≤48 h)
Persistent
(>7 days or requires CV)
Long-standing
Persistent (>1 year)
Permanent
(accepted)

Немая ФП

Table 5 Relevant questions to be put to a patient with suspected or known AF

Does the heart rhythm during the episode feel regular or irregular?
Is there any precipitating factor such as exercise, emotion, or alcohol intake?
Are symptoms during the episodes moderate or severe—the severity may be expressed using the **EHRA score**,[3] which is similar to the CCS-SAF score.[41]
Are the episodes frequent or infrequent, and are they long or short lasting?
Is there a history of concomitant disease such as hypertension, coronary heart disease, heart failure, peripheral vascular disease, cerebrovascular disease, stroke, diabetes, or chronic pulmonary disease?
Is there an alcohol abuse habit?
Is there a family history of AF?

Регулярность ритма

Внешние факторы – нагрузка, алкоголь, …

Симптоматичность (EHRA)

Частота эпизодов

Сопутствующие заболевания (ГБ, СН, ТИА…)

Алкоголизация

Наследственность

Table 6 EHRA score of AF-related symptoms

Classification of AF-related symptoms (EHRA score)	
EHRA class	**Explanation**
EHRA I	'No symptoms'
EHRA II	'Mild symptoms'; normal daily activity not affected
EHRA III	'Severe symptoms'; normal daily activity affected
EHRA IV	'Disabling symptoms'; normal daily activity discontinued

Table 11 Risk factors for ischemic stroke and systemic embolism in patients with nonvalvular atrial fibrillation

Risk factors	Relative risk
Previous stroke or TIA	2.5
Diabetes mellitus	1.7
History of hypertension	1.6
Heart failure	1.4
Advanced age (continuous, per decade)	1.4

Data derived from collaborative analysis of 5 untreated control groups in primary prevention trials.[47] As a group, patients with nonvalvular atrial fibrillation (AF) carry about a 6-fold increased risk of thromboembolism compared with patients in sinus rhythm. Relative risk refers to comparison of patients with AF to patients without these risk factors.

TIA indicates transient ischemic attack.

Table 7 $CHADS_2$ score and stroke rate

$CHADS_2$ score	Patients (n = 1733)	Adjusted stroke rate (%/year)[a] (95% confidence interval)
0	120	1.9 (1.2–3.0)
1	463	2.8 (2.0–3.8)
2	523	4.0 (3.1–5.1)
3	337	5.9 (4.6–7.3)
4	220	8.5 (6.3–11.1)
5	65	12.5 (8.2–17.5)
6	5	18.2 (10.5–27.4)

[a]The adjusted stroke rate was derived from the multivariable analysis assuming no aspirin usage; these stroke rates are based on data from a cohort of hospitalized AF patients, published in 2001, with low numbers in those with a **$CHADS_2$ score** of 5 and 6 to allow an accurate judgement of the risk in these patients. Given that stroke rates are declining overall, actual stroke rates in contemporary non-hospitalized cohorts may also vary from these estimates. Adapted from Gage BF *et al.*[50]

AF = atrial fibrillation; $CHADS_2$ = cardiac failure, hypertension, age, diabetes, stroke (doubled).

CHA2DS2-VASc [congestive heart failure, hypertension, age ≥75 (doubled), diabetes, stroke (doubled), vascular disease, age 65–74, and sex category (female)]

Table 8 CHA_2DS_2VASc score and stroke rate

(a) Risk factors for stroke and thrombo-embolism in non-valvular AF	
'Major' risk factors	**'Clinically relevant non-major' risk factors**
Previous stroke, TIA, or systemic embolism Age ≥75 years	Heart failure or moderate to severe LV systolic dysfunction (e.g. LV EF ≤40%) Hypertension - Diabetes mellitus Female sex - Age 65–74 years Vascular disease[a]

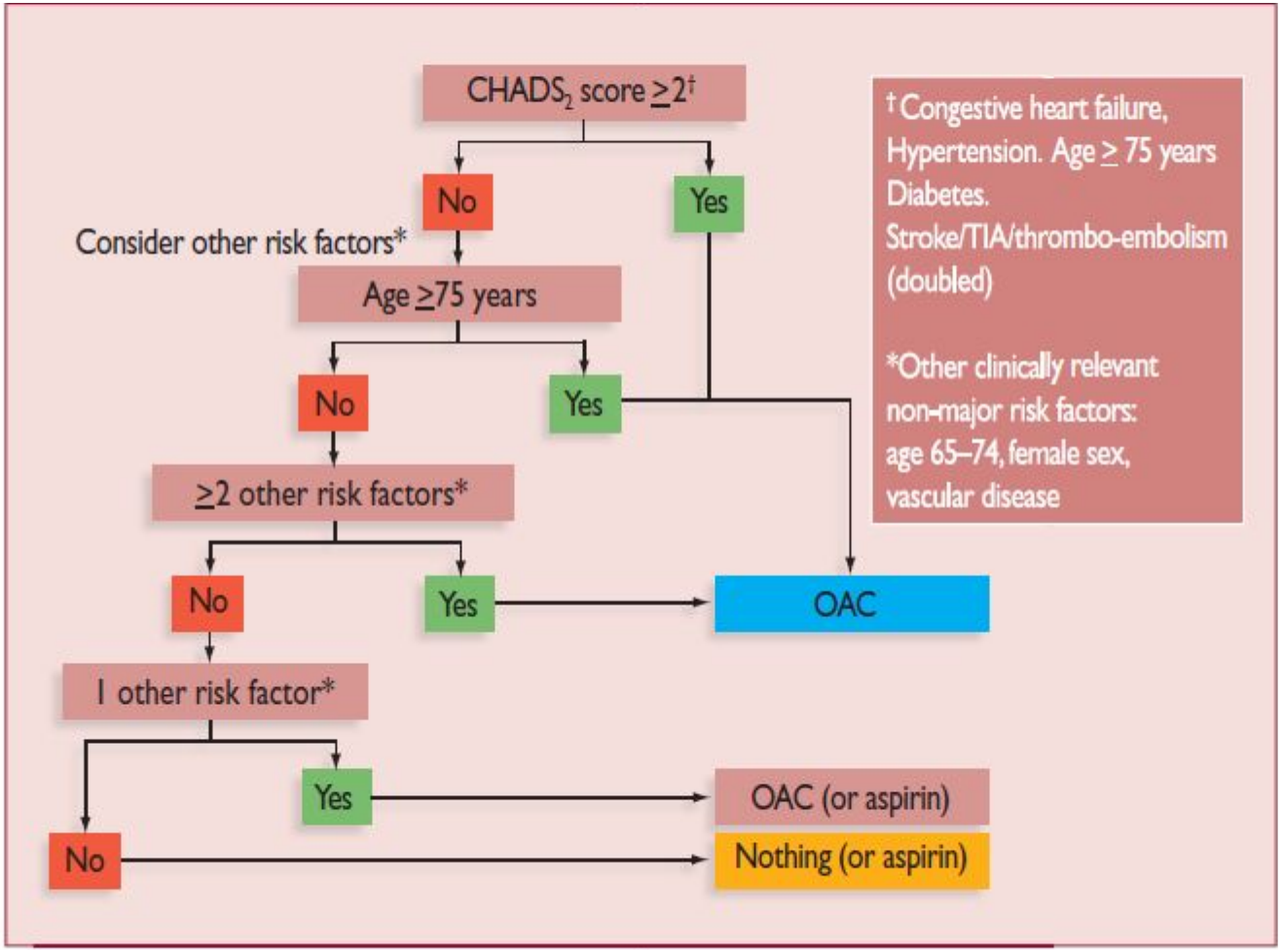
(b) Risk factor-based approach expressed as a point based scoring system, with the acronym CHA_2DS_2-VASc
(Note: maximum score is 9 since age may contribute 0, 1, or 2 points)

Risk factor	Score
Congestive heart failure/LV dysfunction	1
Hypertension	1
Age ≥75	2
Diabetes mellitus	1
Stroke/TIA/thrombo-embolism	2
Vascular disease[a]	1
Age 65–74	1
Sex category (i.e. female sex)	1
Maximum score	**9**

(c) Adjusted stroke rate according to CHA_2DS_2-VASc score

CHA_2DS_2-VASc score	Patients (n=7329)	Adjusted stroke rate (%/year)[b]
0	1	0%
1	422	1.3%
2	1230	2.2%
3	1730	3.2%
4	1718	4.0%
5	1159	6.7%
6	679	9.8%
7	294	9.6%
8	82	6.7%
9	14	15.2%

See text for definitions.
[a]Prior myocardial infarction, peripheral artery disease, aortic plaque. Actual rates of stroke in contemporary cohorts may vary from these estimates.
[b]Based on Lip et al.[5,6]
AF = atrial fibrillation; EF = ejection fraction (as documented by echocardiography, radionuclide ventriculography, cardiac catheterization, cardiac magnetic resonance imaging, etc.); LV = left ventricular; TIA = transient ischaemic attack.


CHADS$_2$ score ≥2†
No
Yes
Consider other risk factors*
Age ≥75 years
No
Yes
≥2 other risk factors*
No
Yes
OAC
1 other risk factor*
Yes
OAC (or aspirin)
No
Nothing (or aspirin)
† Congestive heart failure, Hypertension. Age ≥ 75 years Diabetes. Stroke/TIA/thrombo-embolism (doubled)
*Other clinically relevant non-major risk factors: age 65–74, female sex, vascular disease

Оценка риска кровотечения

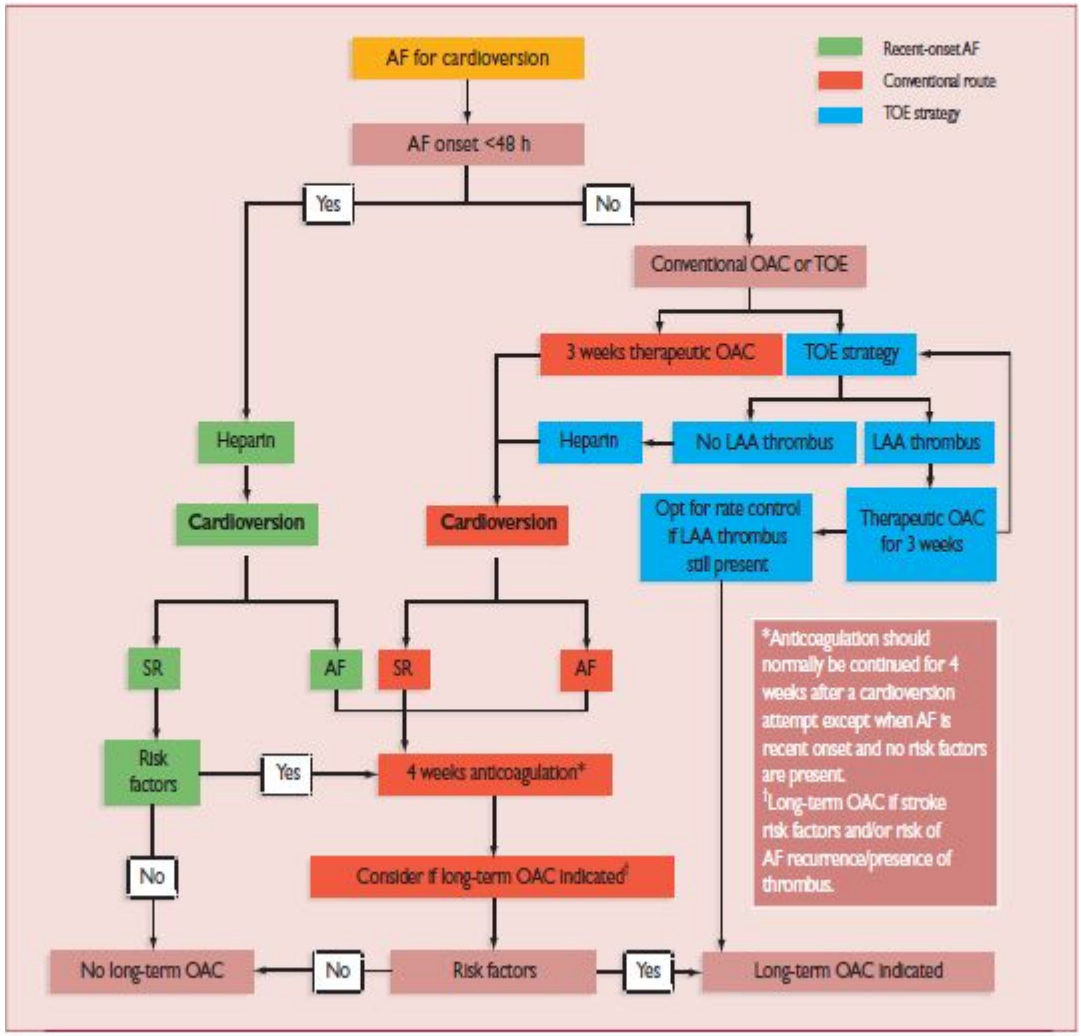
Высокий риск кровотечения ≥ 3

Table 10 Clinical characteristics comprising the HAS-BLED bleeding risk score

Letter	Clinical characteristic[a]	Points awarded
H	Hypertension	1
A	Abnormal renal and liver function (1 point each)	1 or 2
S	Stroke	1
B	Bleeding	1
L	Labile INRs	1
E	Elderly (e.g. age >65 years)	1
D	Drugs or alcohol (1 point each)	1 or 2
		Maximum 9 points

[a]Hypertension' is defined as systolic blood pressure >160 mmHg. 'Abnormal kidney function' is defined as the presence of chronic dialysis or renal transplantation or serum creatinine ≥200 μmol/L. 'Abnormal liver function' is defined as chronic hepatic disease (e.g. cirrhosis) or biochemical evidence of significant hepatic derangement (e.g. bilirubin >2 x upper limit of normal, in association with aspartate aminotransferase/alanine aminotransferase/alkaline phosphatase >3 x upper limit normal, etc.). 'Bleeding' refers to previous bleeding history and/or predisposition to bleeding, e.g. bleeding diathesis, anaemia, etc. 'Labile INRs' refers to unstable/high INRs or poor time in therapeutic range (e.g. <60%). Drugs/alcohol use refers to concomitant use of drugs, such as antiplatelet agents, non-steroidal anti-inflammatory drugs, or alcohol abuse, etc. INR = international normalized ratio. Adapted from Pisters *et al.*[60]

Рекомендации кардиоверсии ФП



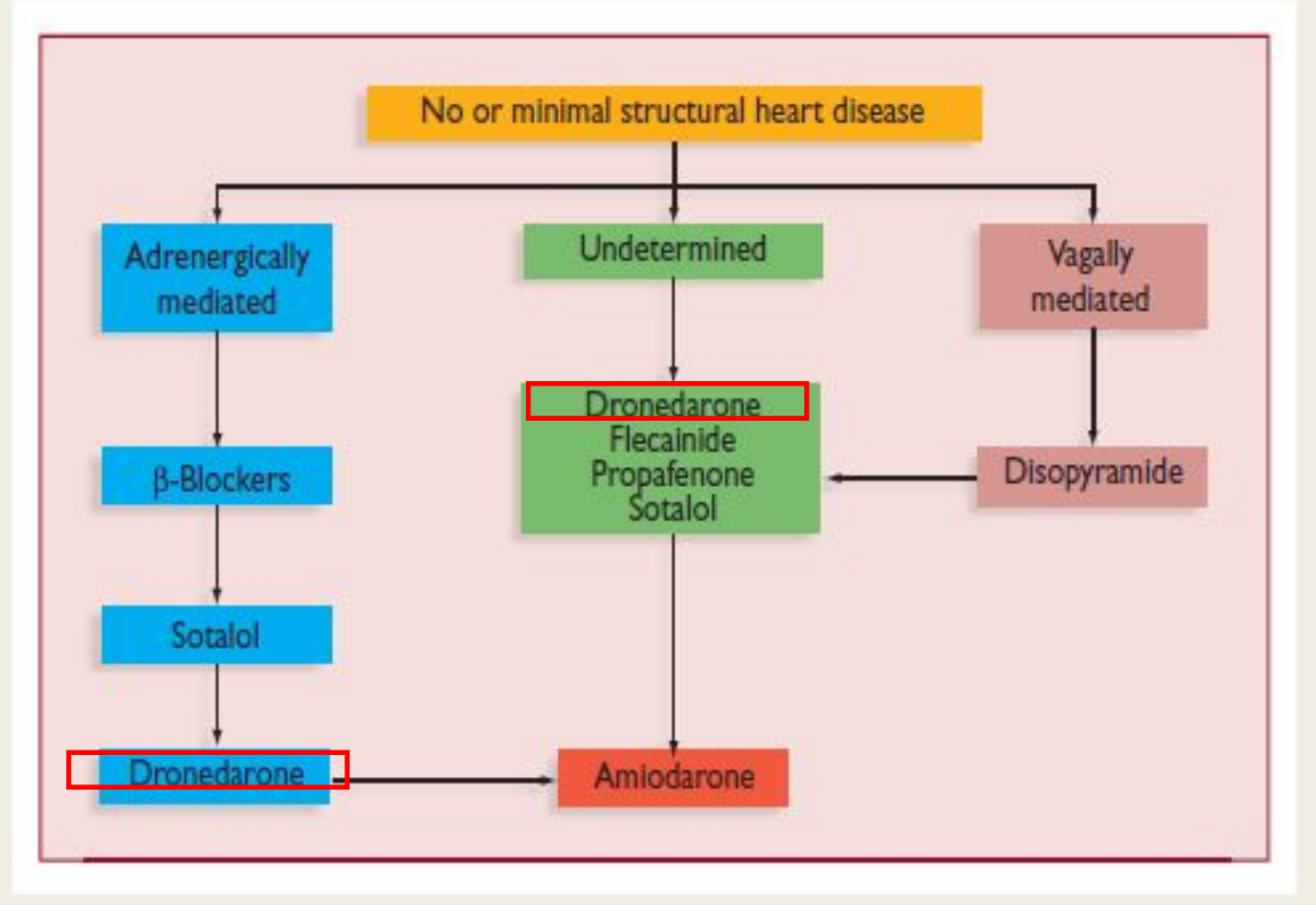
gure 5 Cardioversion of haemodynamically stable AF, the role of TOE-guided cardioversion, and subsequent anticoagulation strategy. AF
ial fibrillation; DCC = direct current cardioversion; LA = left atrium; LAA = left atrial appendage; OAC = oral anticoagulant; SR = sin
ythm; TOE = transoesophageal echocardiography.

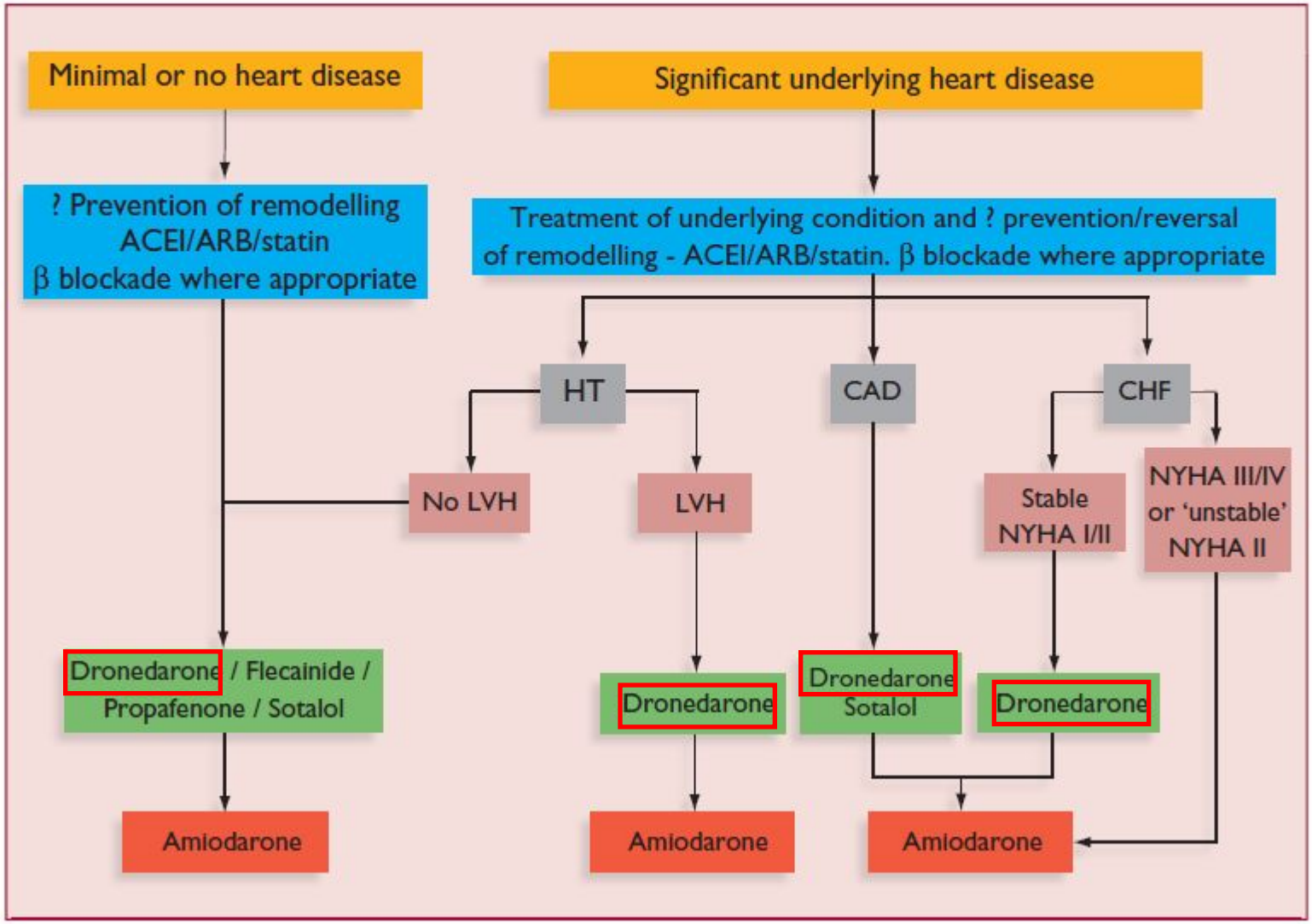
Table 16 Recommendations for pharmacological cardioversion of atrial fibrillation of up to 7-d duration

Drug[a]	Route of administration	Class of recommendation	Level of evidence	References
Agents with proven efficacy				
Dofetilide	Oral	I	A	498–503
Flecainide	Oral or intravenous	I	A	489–491, 493, 504–509
Ibutilide	Intravenous	I	A	510–515
Propafenone	Oral or intravenous	I	A	491, 494, 495, 505, 509, 516–526, 557
Amiodarone	Oral or intravenous	IIa	A	496, 504, 516, 527–534
Less effective or incompletely studied agents				
Disopyramide	In			
Procainamide	In			
Quinidine	Or			
Should not be administered				
Digoxin	Or			
Sotalol	Or			

Drug	Dose	Follow-up dose	Risks
Amiodarone	5 mg/kg i.v. over 1 h	50 mg/h	Phlebitis, hypotension. Will slow the ventricular rate. Delayed AF conversion to sinus rhythm.
Flecainide	2 mg/kg i.v. over 10 min, or 200–300 mg p.o.	N/A	Not suitable for patients with marked structural heart disease; may prolong QRS duration, and hence the QT interval; and may inadvertently increase the ventricular rate due to conversion to atrial flutter and 1:1 conduction to the ventricles.
Ibutilide	1 mg i.v. over 10 min	1 mg i.v. over 10 min after waiting for 10 min	Can cause prolongation of the QT interval and torsades de pointes; watch for abnormal T-U waves or QT prolongation. Will slow the ventricular rate.
Propafenone	2 mg/kg i.v. over 10 min, or 450–600 mg p.o.		Not suitable for patients with marked structural heart disease; may prolong QRS duration; will slightly slow the ventricular rate, but may inadvertently increase the ventricular rate due to conversion to atrial flutter and 1:1 conduction to the ventricles.
Vernakalant	3 mg/kg i.v. over 10 min	Second infusion of 2 mg/kg i.v. over 10 min after15 min rest	So far only evaluated in clinical trials; recently approved. [68–70a]

Поддерживающая терапия



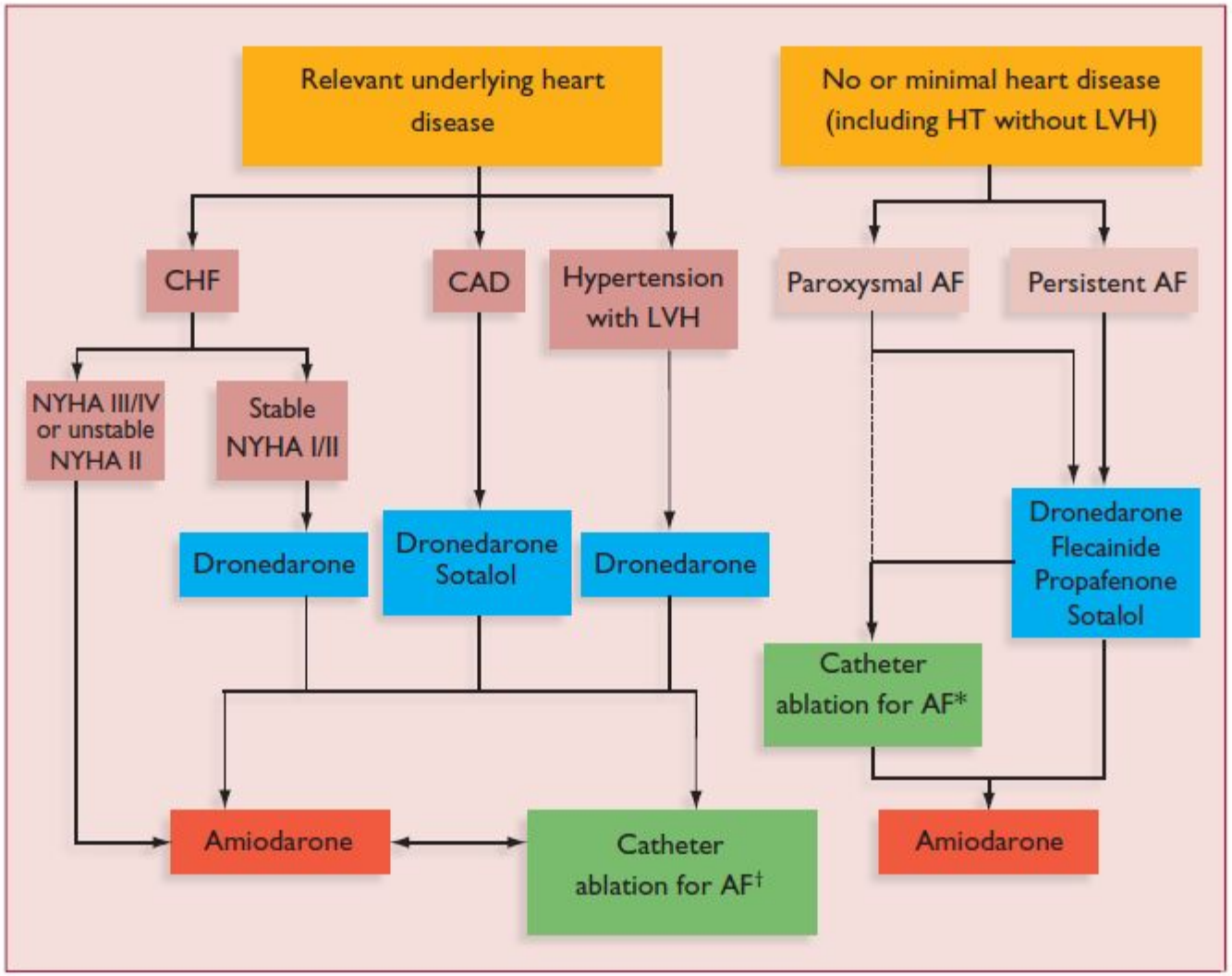

Minimal or no heart disease
Significant underlying heart disease
? Prevention of remodelling
ACEI/ARB/statin
β blockade where appropriate
Treatment of underlying condition and ? prevention/reversal of remodelling - ACEI/ARB/statin. β blockade where appropriate
HT
CAD
CHF
No LVH
LVH
Stable NYHA I/II
NYHA III/IV or 'unstable' NYHA II
Dronedarone / Flecainide / Propafenone / Sotalol
Dronedarone
Dronedarone Sotalol
Dronedarone
Amiodarone
Amiodarone
Amiodarone

Recommendation for choice of antiarrhythmic drug for AF control

	Recommendations	Class[a]	Level[b]	Ref.[c]
	The following antiarrhythmic drugs are recommended for rhythm control in patients with AF, depending on underlying heart disease:			
	• amiodarone	I	A	46, 111, 125
	• dronedarone	I	A	95, 99
	• flecainide	I	A	111, 127
	• propafenone	I	A	111, 125
	• d,l-sotalol	I	A	46, 83, 111
!	Amiodarone is more effective in maintaining sinus rhythm than sotalol, propafenone, flecainide (by analogy), or dronedarone (LoE A), but because of its toxicity profile should generally be used when other agents have failed or are contraindicated (LoE C).	I	A / C	46, 111, 121, 125
!	In patients with severe heart failure, NYHA class III and IV or recently unstable (decompensation within the prior month) NYHA class II, amiodarone should be the drug of choice.	I	B	126
!	In patients without significant structural heart disease, initial antiarrhythmic therapy should be chosen from dronedarone, flecainide, propafenone, and sotalol.	I	A	95, 99, 111, 125–127
!	β-Blockers are recommended for prevention of adrenergic AF.	I	C	
!	If one antiarrhythmic drug fails to reduce the recurrence of AF to a clinically acceptable level, the use of another antiarrhythmic drug should be considered.	IIa	C	
!	Dronedarone should be considered in order to reduce cardiovascular hospitalizations in patients with non-permanent AF and cardiovascular risk factors.	IIa	B	95, 99
	β-blockers should be considered for rhythm (plus rate) control in patients with a first episode of AF.	IIa	C	
!	Disopyramide may be considered in patients with vagally mediated AF.	IIb	B	111, 118, 119
!	Dronedarone is not recommended for treatment of AF in patients with NYHA class III and IV, or with recently unstable (decompensation within the prior month) NYHA class II heart failure.	III	B	117, 122
!	Antiarrhythmic drug therapy is not recommended for maintenance of sinus rhythm in patients with advanced sinus node disease or AV node dysfunction unless they have a functioning permanent pacemaker.	III	C	

DYONYSOS, ANDROMEDA, ATHENA

РЧА ФП



Наблюдение в течение 1 года: 77% - РЧА; 52% - медикаменты

Оценка риска и прием ОАК

РЧА ФП у пациентов с СН и неэфф. ААТ

РЧА длительно-персистирующей ФП

Recommendations for left atrial ablation

Recommendations	Class[a]	Level[b]	Ref.[c]
Ablation of common atrial flutter is recommended as part of an AF ablation procedure if documented prior to the ablation procedure or occurring during the AF ablation.	I	B	33
Catheter ablation for paroxysmal AF should be considered in symptomatic patients who have previously failed a trial of antiarrhythmic medication.	IIa	A	96, 131, 132, 133, 135, 137, 138
Ablation of persistent symptomatic AF that is refractory to antiarrhythmic therapy should be considered a treatment option.	IIa	B	33
In patients post-ablation, LMWH or i.v. UFH should be considered as 'bridging therapy' prior to resumption of systemic OAC, which should be continued for a minimum of 3 months. Thereafter, the individual stroke risk factors of the patient should be considered when determining if OAC therapy should be continued.	IIa	C	
Continuation of OAC therapy post-ablation is recommended in patients with 1 'major' ('definitive') or ≥2 'clinically relevant non-major' risk factors (i.e. CHA_2DS_2-VASc score ≥2).	IIa	B	136
Catheter ablation of AF in patients with heart failure may be considered when antiarrhythmic medication, including amiodarone, fails to control symptoms.	IIb	B	93, 94
Catheter ablation of AF may be considered prior to antiarrhythmic drug therapy in symptomatic patients despite adequate rate control with paroxysmal symptomatic AF and no significant underlying heart disease.	IIb	B	131
Catheter ablation of AF may be considered in patients with symptomatic long-standing persistent AF refractory to antiarrhythmic drugs.	IIb	C	

Upstream Терапия

- ИАПФ и АРА
- Статины
- Антагонисты альдостерона
- Полиненасыщенные жирные кислоты

Recommendations for secondary prevention of AF with 'upstream' therapy

Recommendations	Class[a]	Level[b]	Ref.[c]
Pre-treatment with ACEIs and ARBs may be considered in patients with recurrent AF *and* receiving antiarrhythmic drug therapy.	IIb	B	145–147, 152–153
ARBs or ACEIs may be useful for prevention of recurrent paroxysmal AF or in patients with persistent AF undergoing electrical cardioversion in the absence of significant structural heart disease if these agents are indicated for other reasons (e.g. hypertension).	IIb	B	145, 155–156

Имплантируемые петлевые регистраторы

- Class I
  - возвратные синкопе неизвестной этиологии (3 синкопе за 2 года) **уровень А**
  - пациенты имеющие ЭКГ-признаки возможных синкопальных состояний **Уровень В**
- Класс IIA
  - оценка симптоматичности брадикардии перед имплантацией ЭКС **Уровень в**
- Класс IIB
  - «Сложные» пациенты с транзиторными эпизодами потери сознания **Уровень С**

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ESC GUIDELINES

2010 Focused Update of ESC guidelines on device therapy in heart failure

An update of the 2008 ESC guidelines for the diagnosis and treatment of acute and chronic heart failure and the 2007 ESC guidelines for cardiac and resynchronization therapy

Developed with the special contribution of the Heart Failure Association and the European Heart Rhythm Association

Recommendation in patients with heart failure in New York Heart Association function class III/IV

Recommendation	Patient population	Class[a]	Level[b]	Ref.[c]
CRT-P/CRT-D is recommended to reduce morbidity and mortality[d]	NYHA function class III/IV LVEF ≤35%, QRS ≥120 ms, SR Optimal medical therapy Class IV patients should be ambulatory[e]	I	A	5–19

[a]Class of recommendation.
[b]Level of evidence.
[c]References.
[d]Reasonable expectation of survival with good functional status for >1 year for CRT-D. Patients with a secondary prevention indication for an ICD should receive a CRT-D.
[e]No admissions for HF during the last month and a reasonable expectation of survival >6 months.
CRT = cardiac resynchronization therapy; CRT-P = CRT with pacemaker function; CRT-D = CRT with defibrillator function; ICD = implantable cardioverter defibrillator; LVEF = left ventricular ejection fraction; NYHA = New York Heart Association; SR = sinus rhythm.

Recommendation in patients with heart failure in New York Heart Association function class II

Recommendation	Patient population	Class[a]	Level[b]	Ref.[c]
CRT preferentially by CRT-D is recommended to reduce morbidity or to prevent disease progression[d]	NYHA function class II LVEF ≤35%, QRS ≥150 ms, SR Optimal medical therapy	I	A	9, 20–22

[a]Class of recommendation.
[b]Level of evidence.
[c]References.
[d]The guideline indication has been restricted to patients with HF in NYHA function class II with a QRS width ≥150 ms, a population with a high likelihood of a favourable response.
CRT = cardiac resynchronization therapy; CRT-D = CRT with defibrillator function; HF = heart failure; LVEF = left ventricular ejection fraction; NYHA = New York Heart Association; SR = sinus rhythm.

Recommendations in patients with heart failure and permanent atrial fibrillation

Recommendations	Patient population	Class[a]	Level[b]	Ref.[c]
CRT-P/CRT-D[d] should be considered to reduce morbidity	NYHA function class III/IV LVEF ≤35%, QRS ≥130 ms Pacemaker dependency induced by AV nodal ablation	IIa	B	27–40
CRT-P/CRT-D[d] should be considered to reduce morbidity	NYHA function class III/IV LVEF ≤35%, QRS ≥130 ms Slow ventricular rate and frequent pacing[e]	IIa	C	—

[a]Class of recommendation.
[b]Level of evidence.
[c]References.
[d]Reasonable expectation of survival with good functional status for >1 year for CRT-D. Patients with a secondary prevention indication for an ICD should receive a CRT-D.
[e]Frequent pacing is defined as ≥95% pacemaker dependence.

Recommendations in patients with heart failure and a concomitant class I pacemaker indication

Recommendations	Patient population	Class[a]	Level[b]	Ref.[c]
CRT-P/CRT-D[d] is recommended to reduce morbidity	NYHA function class III/IV LVEF ≤35%, QRS ≥120 ms	I	B	41–48
CRT-P/CRT-D[d] should be considered to reduce morbidity	NYHA function class III/IV LVEF ≤35%, QRS <120 ms	IIa	C	—
CRT-P/CRT-D[d] may be considered to reduce morbidity	NYHA function class II LVEF ≤35%, QRS <120 ms	IIb	C	—

[a]Class of recommendation.
[b]Level of evidence.
[c]References.
[d]Reasonable expectation of survival with good functional status for >1 year for CRT-D. Patients with a secondary prevention indication for an ICD should receive a CRT-D.
CRT = cardiac resynchronization therapy; CRT-P = CRT with pacemaker function; CRT-D = CRT with defibrillator function; LVEF = left ventricular ejection fraction; NYHA = New York Heart Association; SR = sinus rhythm.