IX Reunión de Insuficiencia Cardíaca

1-2 marzo 2007

Elche (Alicante)

Centro de Congresos Ciutat d'Elx

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Servicio de Medicina Interna

Complejo Asistencial de León

Edificio "Monte San Isidro"

LEON

NUEVAS GUIAS EN FA

AYUDAN AL CLÍNICO

TOMA DE DECISIONES

MEJOR EVIDENCIA

EVITAR LA VARIABILIDAD INJUSTIFICADA DE LA PRÁCTICA CLÍNICA

FLEXIBILIDAD

SITUACIONES COMPLEJAS

Need for this guideline

AF is a significant risk factor for mortality, as well as stroke and other morbidities

AF is the commonest sustained cardiac arrhythmia

Too often, AF is detected only after the patient presents with serious complications of AF

AF incidence and prevalence increase with increasing age. With an increasingly elderly population, AF is likely to become more common

NICE, originalidades

Auto control de la anticoagulación.

Terapia pill-in-pocket para algunas FA paroxísticas.

Han contado con representantes de pacientes.

Invertidos los símbolos de grado de recomendación (A,B,C)/niveles de evidencia (I,II,etc). Más compleja.

GPP. Punto de buena práctica La experiencia de los que han hecho la Guía. (D)

Incluye evidencia para tests diagnósticos.

Table 2.1 Criteria for grading evidence and recommendations. Note that diagnostic study levels of evidence and classification of recommendations were also included.[16]

Levels of evidence		Classification of recommendations	
Level	Type of evidence	Class	Evidence
1++	High-quality meta-analysis (MA), systematic reviews (SR) of randomised controlled trials (RCTs), or RCTs with a very low risk of bias.	A	Level 1++ and directly applicable to the target population *or* level 1+ and directly applicable to the target population **AND** consistency of results. Evidence from NICE technology appraisal.
1+	Well-conducted MA, SR or RCTs, or RCTs with a low risk of bias.		
1–	MA, SR of RCTs, or RCTs with a high risk of bias.	Not used as a basis for making a recommendation.	
2++	High-quality SR of case-control or cohort studies. High-quality case-control or cohort studies with a very low risk of confounding, bias or chance and a high probability that the relationship is causal.	B	Level 2++, directly applicable to the target population and demonstrating overall consistency of results. *or* extrapolated evidence from 1++ or 1+.
2+	Well-conducted case-control or cohort studies with a low risk of confounding, bias or chance and a moderate probability that the relationship is causal.		
2–	Case-control or cohort studies with a high risk of confounding, bias or chance and a significant risk that the relationship is not causal	Not used as a basis for making a recommendation.	
3	Non-analytic studies (for example case reports, case series).	C	Level 2+, directly applicable to the target population and demonstrating overall consistency of results *or* extrapolated evidence from 2++.
4	Expert opinion, formal consensus.	D	Level 3 or 4 *or* extrapolated from 2+ *or* formal consensus.
		D (GPP)	A good practice point (GPP) is a recommendation based on the experience of the GDG.

Diagnostic study level of evidence and classification of recommendation was also included.[2]

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Circulation 2006,114;257-354

Key steps in the production of ESC guidelines and derivatives

3-4 TF meetings over approximately 2 years

2-5 months review process

CPG approval

2-3 months publication phase

Full text & executive summary

Pocket guidelines

PDAs version

Educational slide sets

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DE LA COMUNIDAD VALENCIANA

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Ed.2003

V. Fibrilación auricular

Grado de las recomendaciones y niveles de evidencia

Clase I

Son las condiciones en las que hay evidencia y/o acuerdo general en que el tratamiento/procedimiento es útil, beneficioso y efectivo.

Clase II

Condiciones en las que existen evidencias contrapuestas y/o divergencia de opiniones sobre la utilidad/eficacia del tratamiento/procedimiento

IIa . El peso de la evidencia/opinión está a favor de la utilidad/eficacia.

IIb. La utilidad/eficacia está menos establecida por la opinión/evidencia.

Clase III

Condiciones en las que hay evidencia y/o acuerdo general en que el tratamiento no es útil/efectivo y que, en algunas ocasiones, puede ser perjudicial.

Nivel de evidencia A. Cuando la evidencia procede de múltiples ensayos clínicos aleatorizados.

Nivel de evidencia B. Cuando la evidencia procede de un único ensayo clínico aleatorizado o de ensayos clínicos no aleatorizados bien diseñados.

Nivel de evidencia C. Cuando la indicación se hace exclusivamente en base al consenso u opinión de expertos.

ACXFA

ABORDAJE SIMILAR

FLUTTER

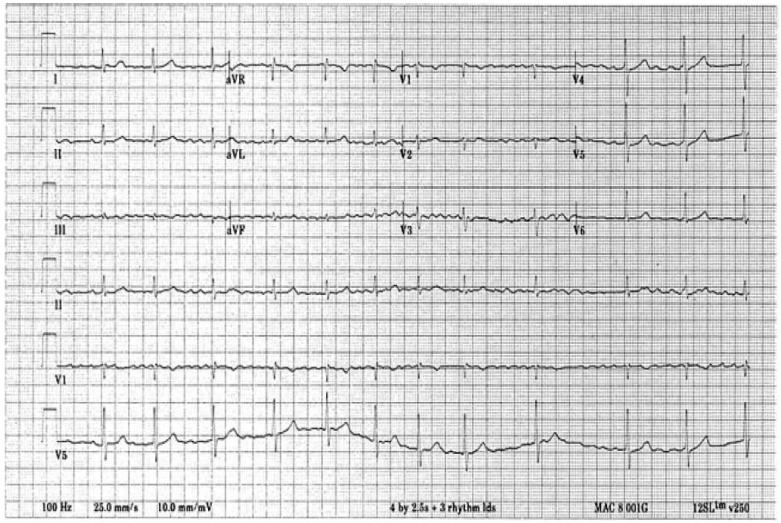


Figure 1. Electrocardiogram showing atrial fibrillation with a controlled rate of ventricular response. P waves are replaced by fibrillatory waves and the ventricular response is completely irregular.

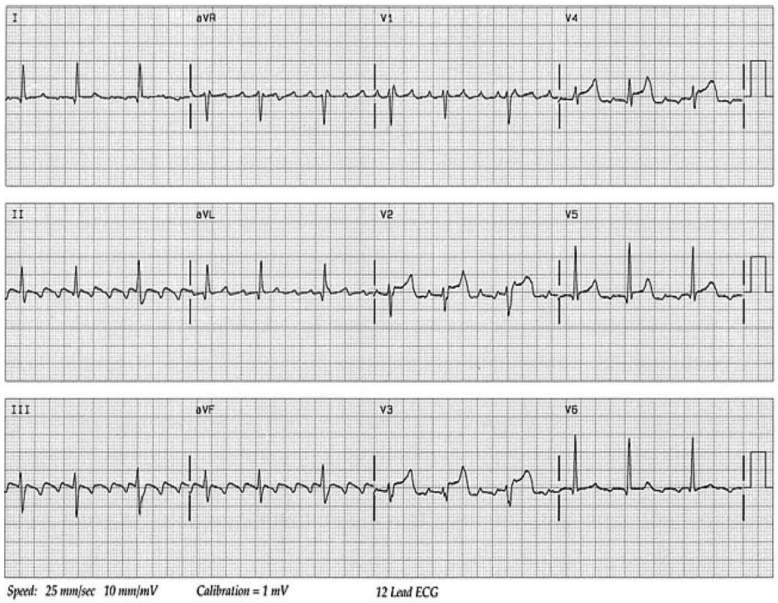


Figure 2. Electrocardiogram showing typical atrial flutter with variable atrioventricular conduction. Note the saw-tooth pattern, F waves, particularly visible in leads II, III, and aVF, without an isoelectric baseline between deflections.

Atrial fibrillation (AF)

- AF – the most common significant cardiac arrhythmia
  - Estimated to affect 4.5 million people in the EU and 2.2 million people in the US
  - Incidence of 9.9 per 1000 person-years in a large European study (N=6432)
- Incidence of AF strongly age dependent – prevalence ~10% in those aged >80 years
- AF increases the risk of stroke 5-fold
  - AF is directly responsible for 15–20% of strokes
- AF is also a significant risk factor for stroke recurrence and severity
- The population is aging …

Singer *et al.*, *Chest* 2004; Fuster *et al.*, *Circulation* 2006; Heeringa *et al.*, *Eur Heart J* 2006

FOCOS AUTOMÁTICOS

EN VENAS PULMONARES

REENTRADA

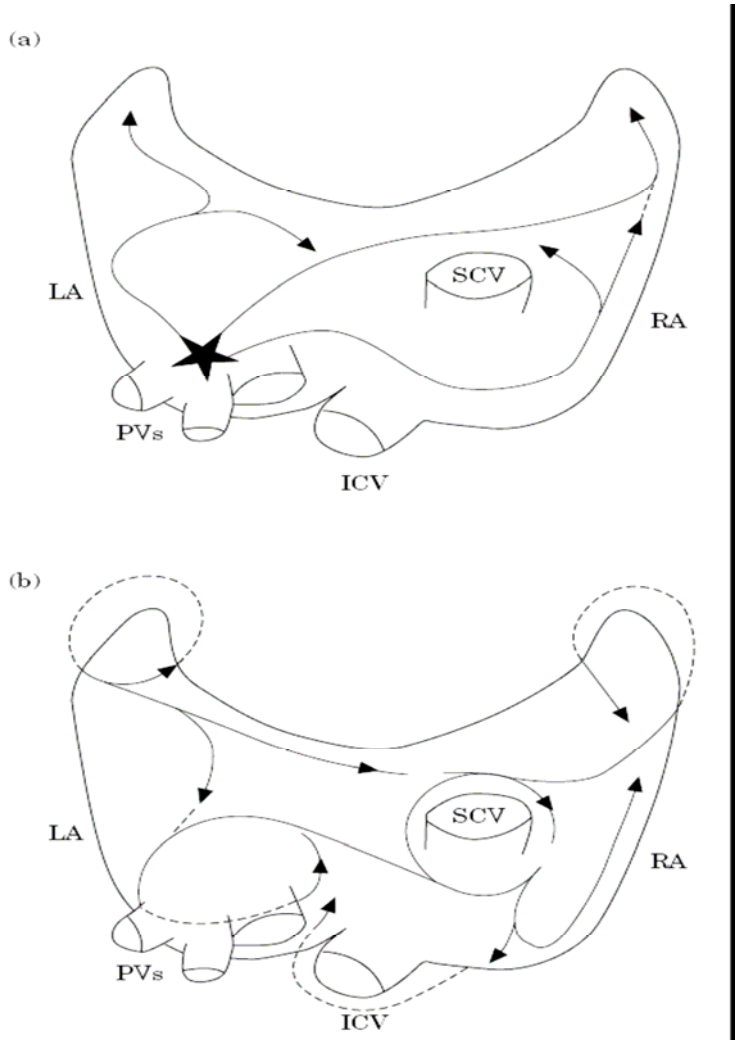


Figure 8. **Principal electrophysiological mechanisms of atrial fibrillation. (a) Focal activation. The initiating focus (indicated by the asterisk) often lies within the region of the pulmonary veins. The resulting wavelets represent fibrillatory conduction, as in multiple-wavelet reentry. (b) Multiple-wavelet reentry. Wavelets (indicated by arrows) randomly reenter tissue previously activated by them or by another wavelet. The routes the wavelets travel vary. LA indicates left atrium; PV, pulmonary vein; ICV, inferior vena cava; SCV, superior vena cava; and RA, right atrium. Reproduced with permission from Konings KTS[64].**

FISOPATOLOGÍA DE LA FA

Consecuencias hemodinámicas

Pérdida de actividad mecánica auricular.

Irregularidad en la respuesta ventricular.

Taquicardiomiopatía.

Deterioro del gasto cardíaco.

Trombos en la aurícula/orejuela izda.

Situación protrombótica, “per se”.

AF causes pro-thrombotic remodeling besides atrial stasis; AF increases the following prothrombotic factors

- Factor VIII
- Fibrinogen
- D-dimer
- Prothrombin factor 1.2
- Thrombin-Antithrombin complex
- Interleukin-6 *(Conway et al. JACC 2004;43:2075-2082)*
- P-selectin
- B Thromboglobulin
- Platelet Factor 4

In addition there is a reduction of nitric oxide

Clasificación clínica

Con/sin síntomas.

Con/sin enfermedad cardíaca detectable.

Más de 2 episodios conocidos: recurrente.

Si remite espontáneamente: Paroxística.

Si más de 48 h.: Persistente.

Si falla/ No se indica CV: Permanente, aceptada, “resignada”.

Secundaria: otra enfermedad o condición precipitante.

Aislada: <60 años, sin enf. Cardiopulmonar asociada.

Valvular/ no Valvular.

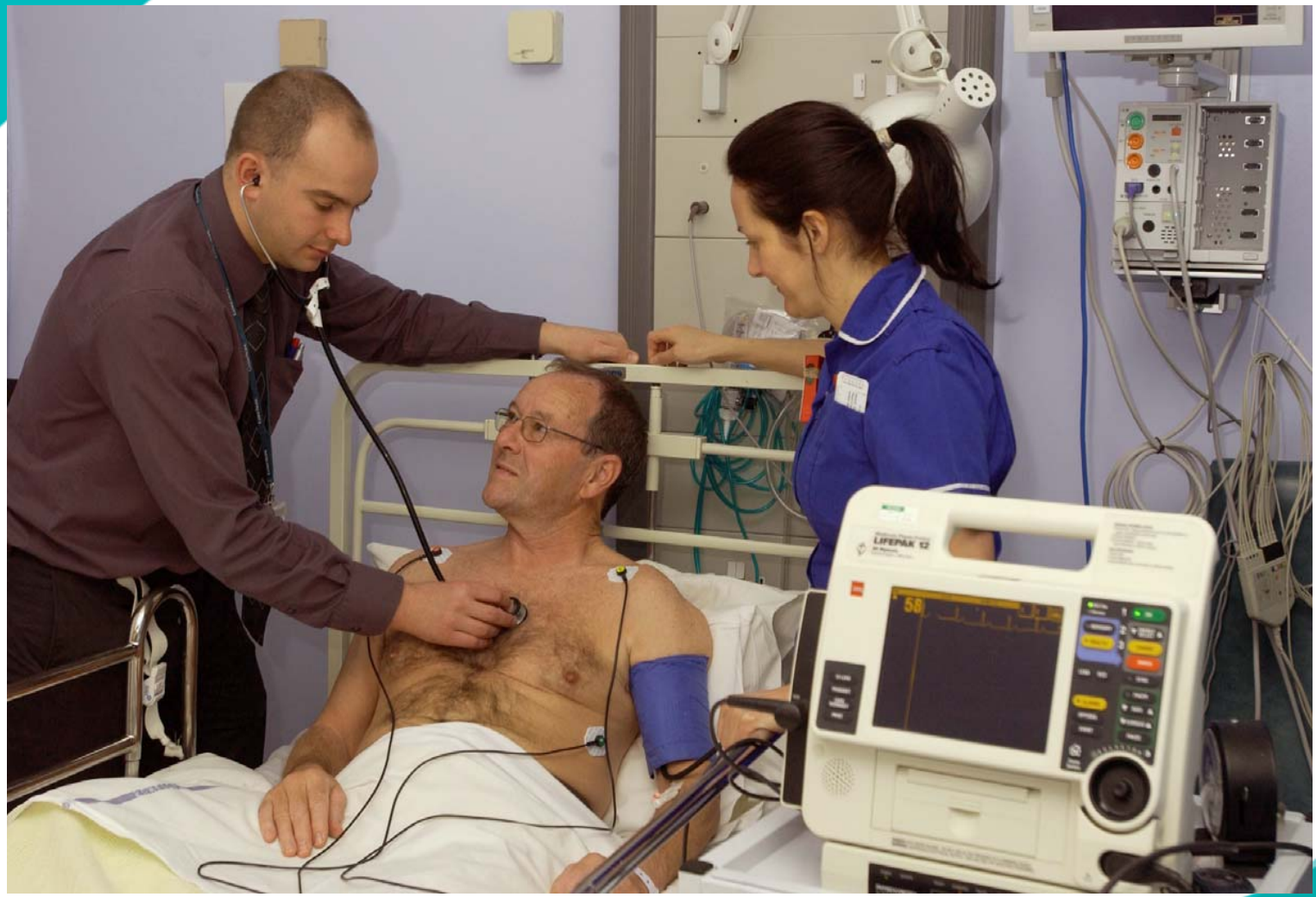
Post- Cirugía Cardíaca.

Classification of AF

Terminology	Clinical features	Pattern
Initial event (first detected episode)	Symptomatic Asymptomatic Onset unknown	May or may nor reoccur
Paroxysmal	Spontaneous termination <7 days and most often <48 hours	Recurrent
Persistent	Not self-terminating Lasting >7 days or prior cardioversion	Recurrent
Permanent (‘accepted’)	Not terminated Terminated but relapsed No cardioversion attempt	Established

Table 4.1 Presenting symptoms associated with emergency AF admissions

Study	N	Dyspnoea %	Chest pain %	Palpitations %	Dizziness /syncope %
Zarifis et al[8]	245	47.1	19.9	16.2	16.2
Lip et al[7]	170	51.8	34.1	25.9	18.8
Michael et al[26]	289	7	10	78	3
Burton et al[27]	266	12	24	40	9



Reproduced by kind permission of Ashford and St. Peter’s Hospitals NHS Trust

Minimum clinical evaluation in patients with atrial fibrillation

1. **History and physical examination, to define**
   - Presence and nature of symptoms associated with AF
   - Clinical type of AF (first episode, paroxysmal, persistent, or permanent)
   - Onset of the first symptomatic attack or date of discovery of AF
   - Frequency, duration, precipitating factors, and modes of termination of AF
   - Response to any pharmacological agents that have been administered
   - Presence of any underlying heart disease or other reversible conditions (e.g., hyperthyroidism or alcohol consumption)
2. **Electrocardiogram, to identify**
   - Rhythm (verify AF)
   - LV hypertrophy
   - P-wave duration and morphology or fibrillatory waves
   - Pre-excitation
   - Bundle-branch block
   - Prior MI
   - Other atrial arrhythmias
   - To measure and follow the R-R, QRS, and QT intervals in conjunction with antiarrhythmic drug therapy
3. **Transthoracic echocardiogram, to identify**
   - Valvular heart disease
   - LA and RA atrial size
   - LV size and function
   - Peak RV pressure (pulmonary hypertension)
   - LV hypertrophy
   - LA thrombus (low sensitivity)
   - Pericardial disease
4. **Blood tests of thyroid, renal, and hepatic function**
   - For a first episode of AF, when the ventricular rate is difficult to control

AF = atrial fibrillation; LA = left atrial; LV = left ventricular; MI = myocardial infarction; RA = right atrial; RV = right ventricular.

Additional testing in patients with atrial fibrillation

1. Six-minute walk test
- If the adequacy of rate control is in question

2. Exercise testing
- If the adequacy of rate control is in question (permanent AF)
- To reproduce exercise-induced AF
- To exclude ischaemia before treatment of selected patients with a type IC antiarrhythmic drug

3. Holter monitoring or event recording
- If diagnosis of the type of arrhythmia is in question
- As a means of evaluating rate control

4. Transesophageal echocardiography
- To identify LA thrombus (in the LA appendage)
- To guide cardioversion

5. Electrophysiological study
- To clarify the mechanism of wide-QRS-complex tachycardia
- To identify a predisposing arrhythmia such as atrial flutter or paroxysmal supraventricular tachycardia
- To seek sites for curative ablation or AV conduction block/modification

6. Chest radiograph, to evaluate
- Lung parenchyma, when clinical findings suggest an abnormality
- Pulmonary vasculature, when clinical findings suggest an abnormality

Type IC refers to the Vaughan Williams classification of antiarrhythmic drugs.
AF = atrial fibrillation; AV = atrioventricular; LA = left atrial.

Proposed management strategies

- Strategic objectives:
  - Rate control
    - Ventricular rate is controlled with no commitment to restore or maintain sinus rhythm
  - Prevention of thromboembolism
    - Antithrombotic therapy
  - Correction of rhythm disturbance
    - Restoration and/or maintenance of sinus rhythm
    - Also requires attention to rate control

ACC/AHA/ESC 2006 guidelines for the management of atrial fibrillation

Rate vs. Rhythm control

Evidence gained since 2001 incorporated

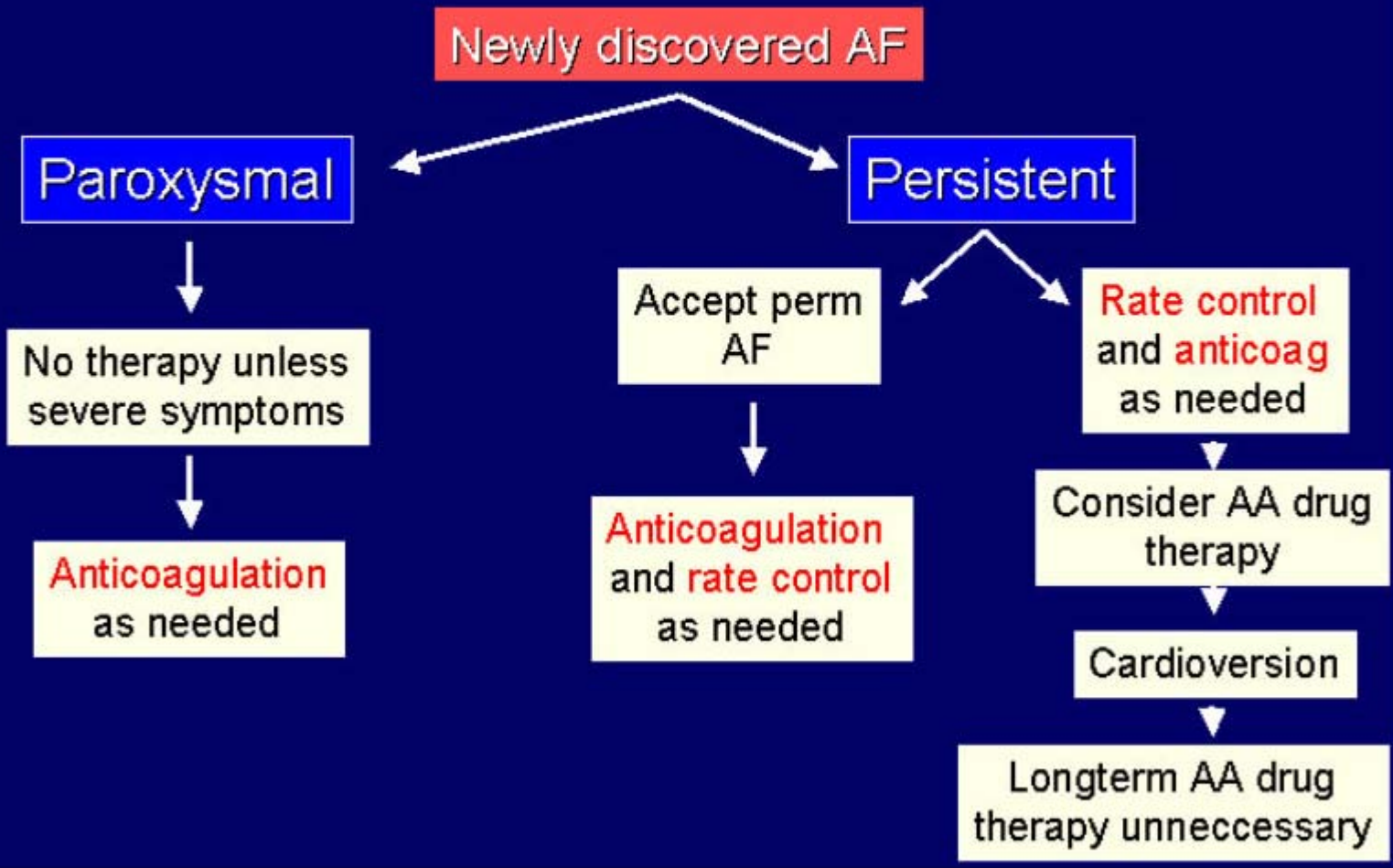
Some major trials published in particular related to the issue of rate vs. rhythm control

Trial	Published	Pat no	Age	SR (%)	TE/Death
AFFIRM	2002	4060	70 ± 9	35 vs. 63	n.s.
RACE	2002	522	68 ± 9	10 vs. 39	n.s.
PIAF	2000	252	61±10	10 vs. 56	n.s.
STAF	2003	200	66 ± 8	11 vs. 26	n.s.
HOT CAFÉ	2004	205	61±11	? vs. 64	n.s.

	Rhythm control	Rate control
Anti-arrhythmic		
Class Ia	Disopyramide Procainamide Quinidine	-- -- --
Class Ic	Flecainide Propafenone	-- --
Class II	--	betablockers (eg metoprolol, carvedilol)
Pure Class III	Dofetilide Ibutilide	-- --
Class IV	-- --	diltiazem verapamil
Multifactorial	Sotalol Amiodarone	sotalol amiodarone
Digitalis	-- --	digoxin digitoxin

ACC/AHA/ESC 2006 guidelines for the management of atrial fibrillation

Management of patients with newly discovered AF



Epidemiologia del ictus con FA

15% de todos los ictus

2-8% de todos los AIT

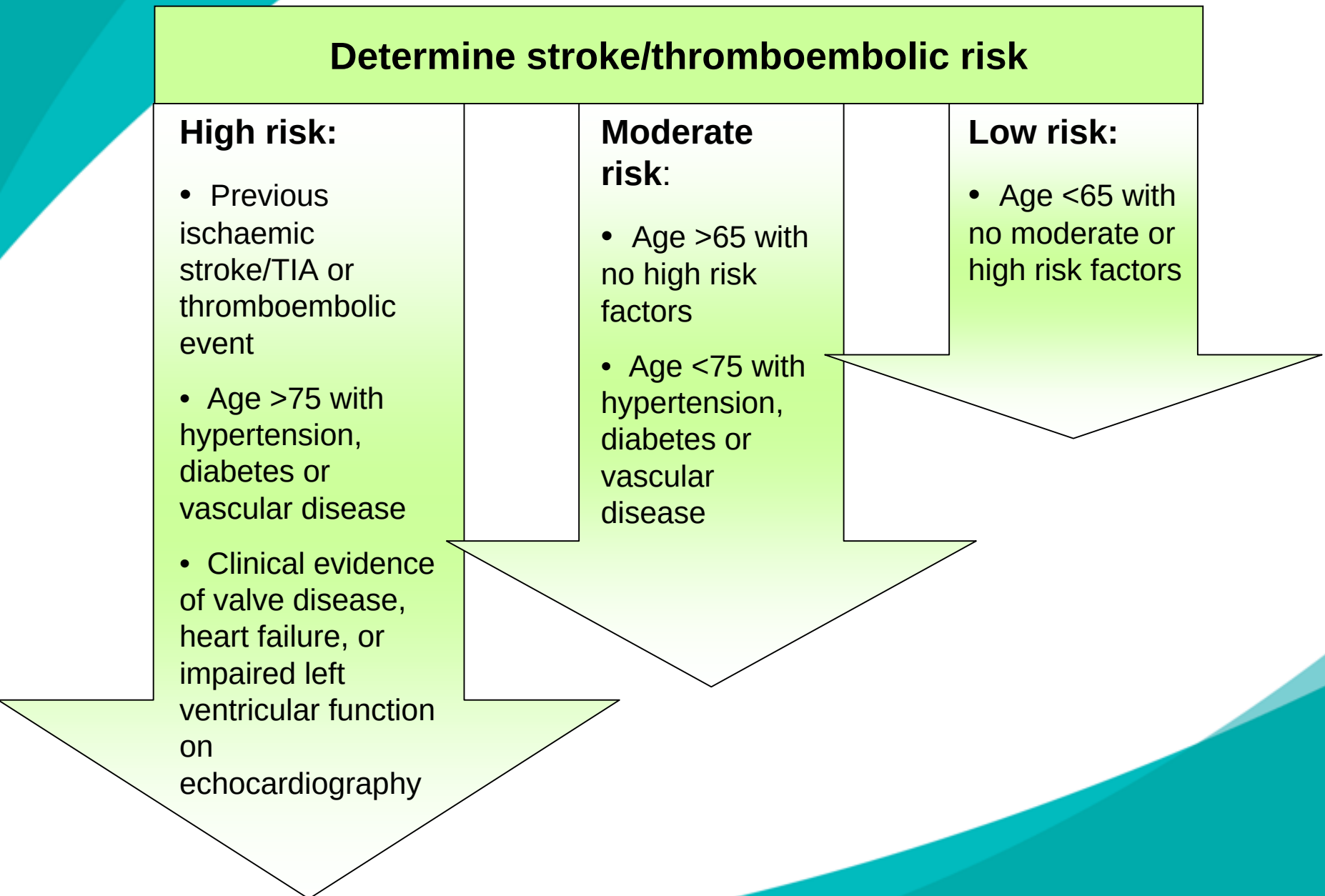
1/6 ictus tienen FA

Con valvulopatía multiplica por 17 el RR

5% al año de RR en FA no valvular que es la fuente cardioembólica más frecuente

La FA es protrombótica “per se”

Patients with AF



Patients with AF, NICE Guidelines

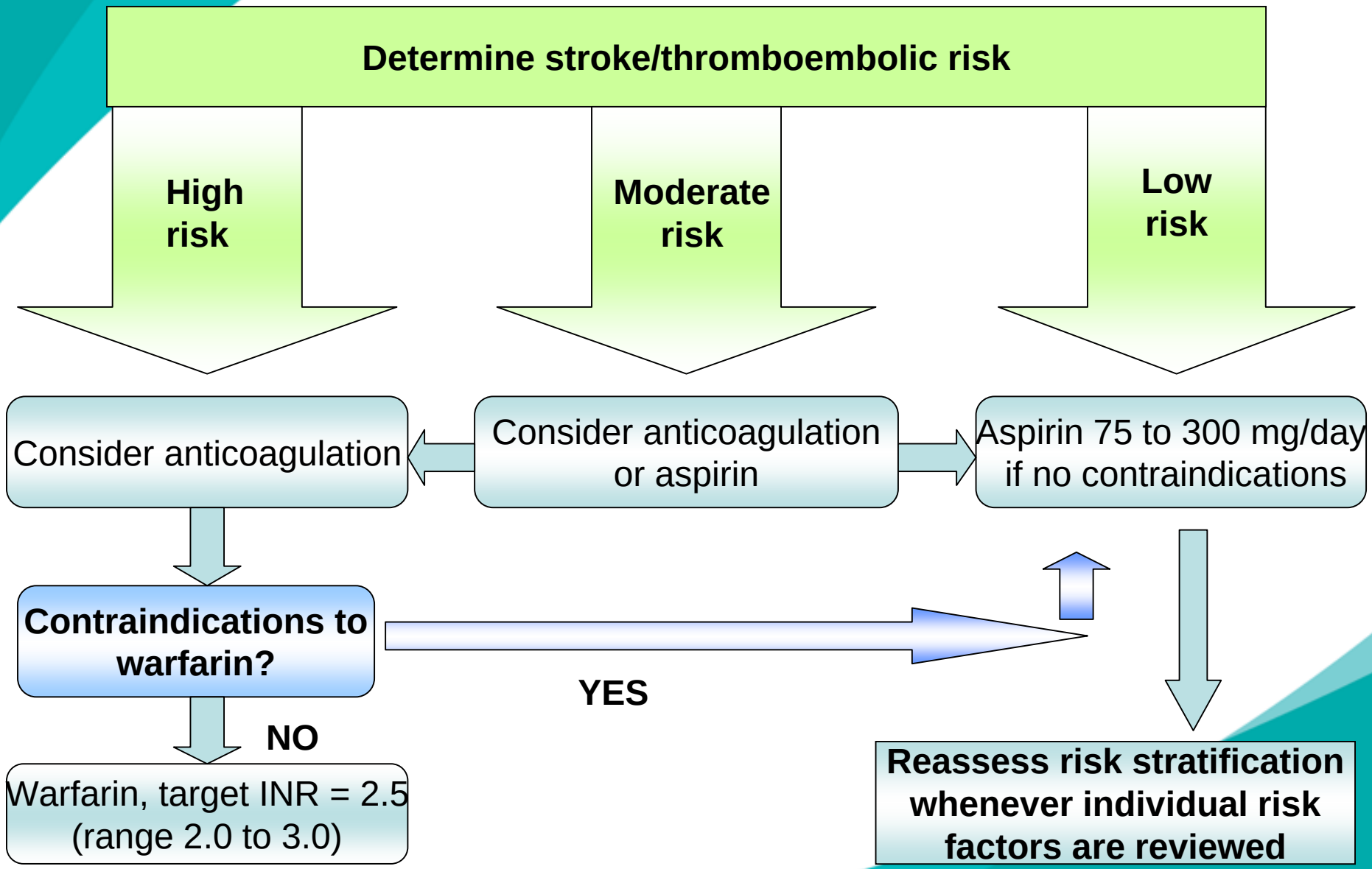
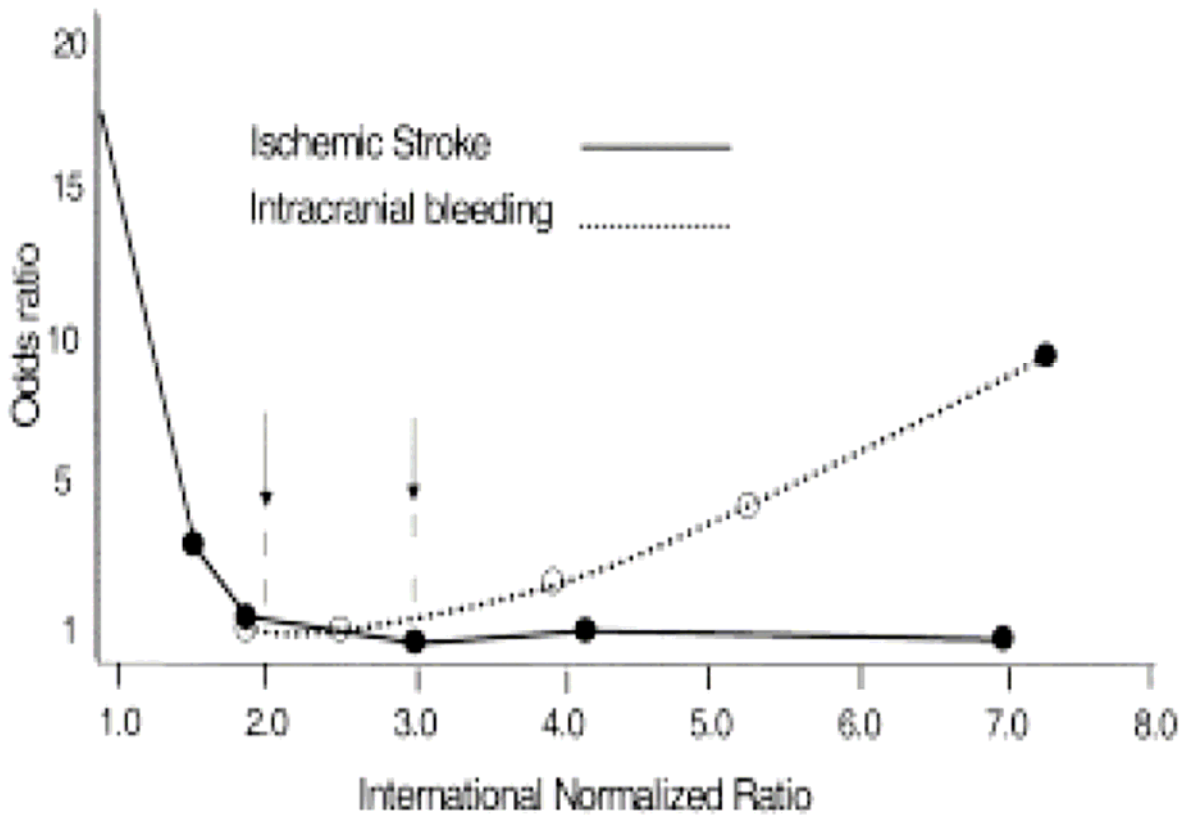


FIGURA 2
Riesgo de ictus y hemorragia intracraneal en relación a la intensidad de la anticoagulación



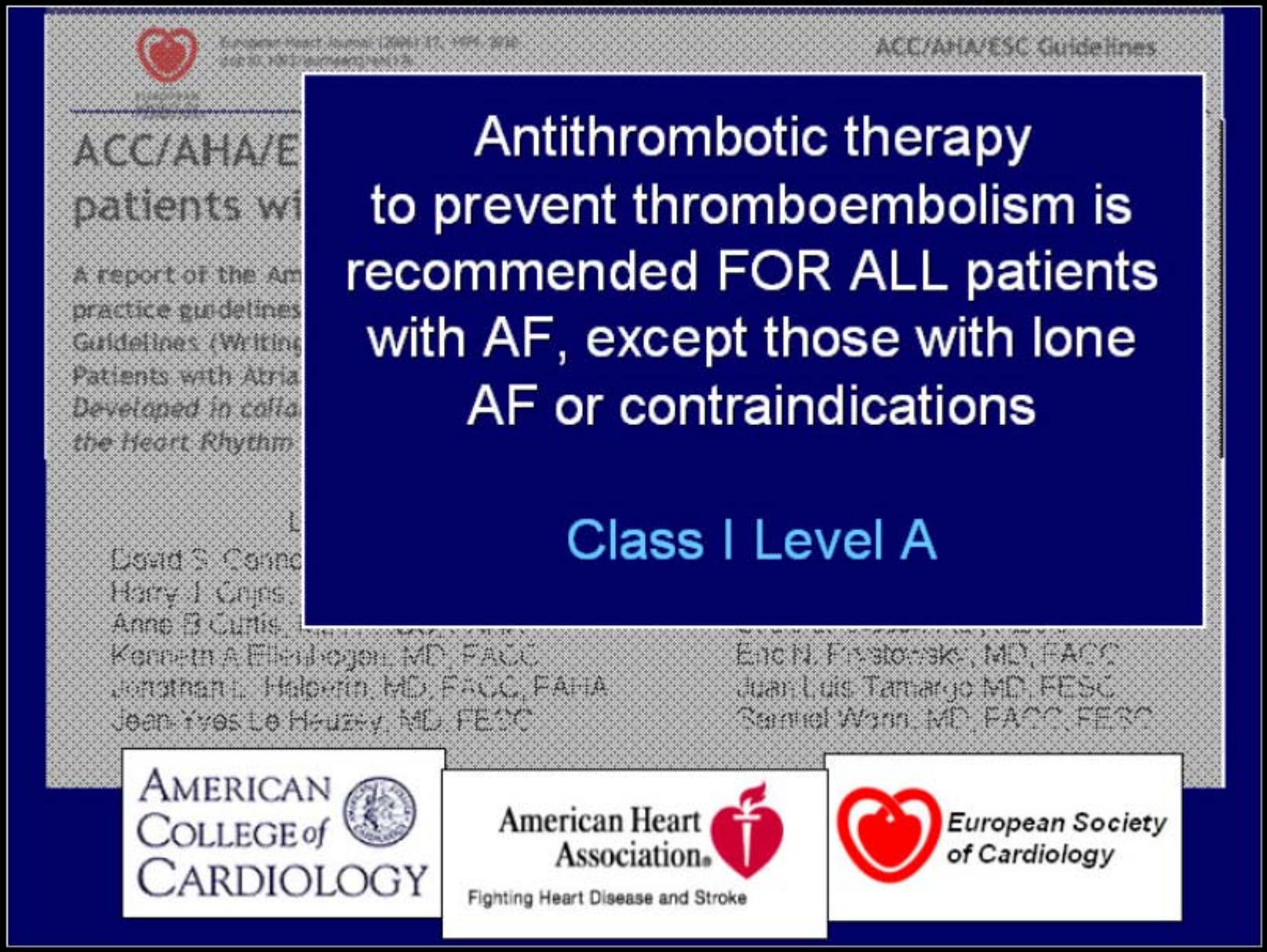
De HyleK, N Engl J Med 1996; 335:540

ACC/AHA/ESC 2006 guidelines for the management of atrial fibrillation

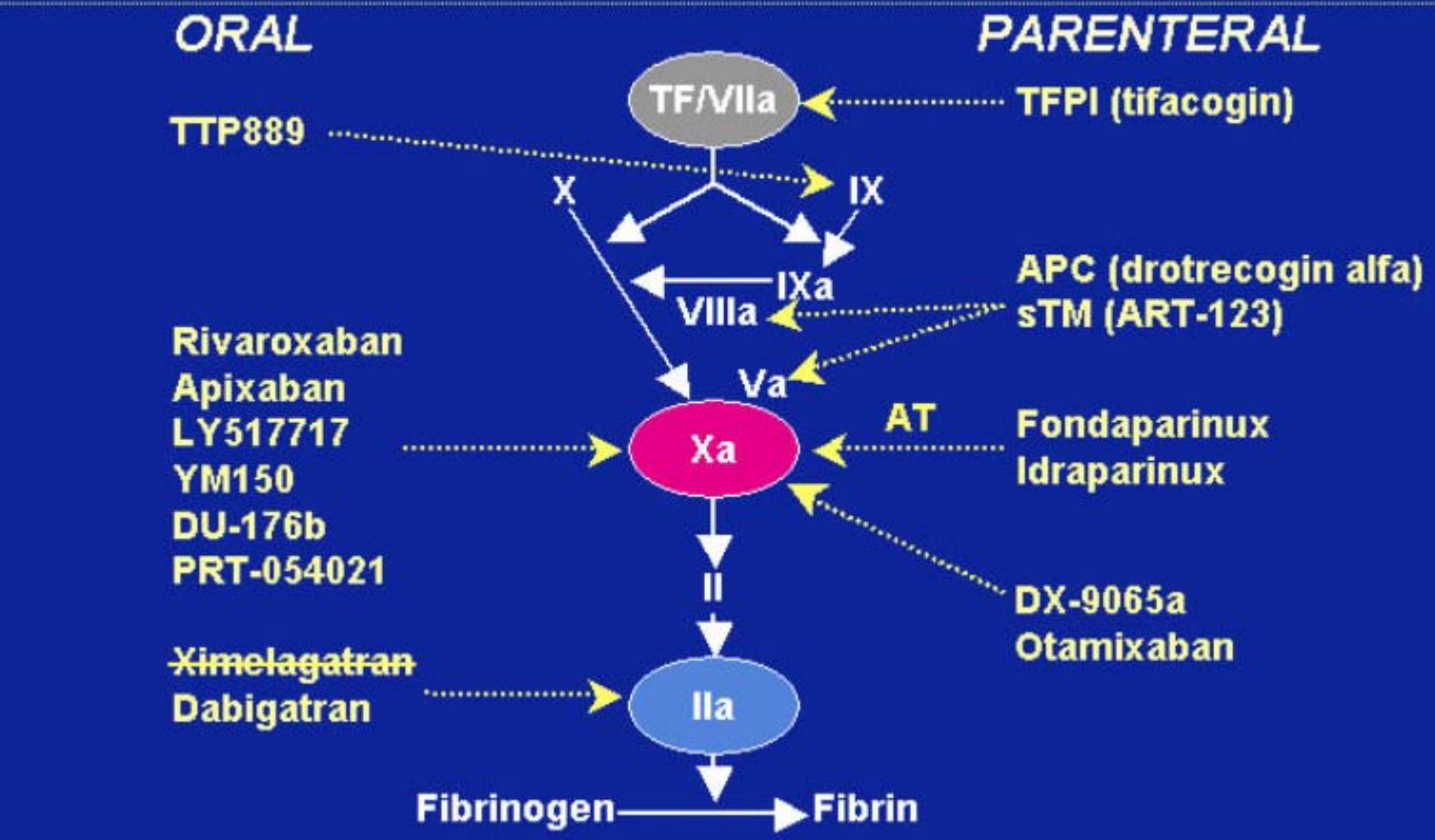
Antithrombotic therapy for patients with atrial fibrillation

Therapy

Risk factor no	Recommended therapy
No	Aspirin 81-325 mg/day
One moderate	Aspirin 81-325 mg/day or Warfarin INR 2-3
Any high or >1 moderate	Warfarin INR 2-3


ACC/AHA/ESC Guidelines
Antithrombotic therapy to prevent thromboembolism is recommended FOR ALL patients with AF, except those with lone AF or contraindications
Class I Level A
AMERICAN COLLEGE of CARDIOLOGY
American Heart Association
Fighting Heart Disease and Stroke
European Society of Cardiology

New anticoagulants



Adapted from Weitz & Bates, *J Thromb Haemost* 2005

Recomendaciones útiles

- AC X FA IGUAL QUE EL FLUTTER. IIa-B.

- AF NO VALVULAR/PROTESIS SE PUEDE INTERRUMPIR 1 SEMANA LA ACO. IIa-C.

- ACO BAJA INTENSIDAD. NO MENOS DE INR 2. >75 AÑOS CON RIESGO DE SANGRADO. IIb-C.

- HBPM DE SUSTITUCION EN ALTO RIESGO. IIb-C.

- EVENTO SOBRE ACO, SUBIR INR3-3,5. IIb-C

ACC/AHA/ESC 2006 guidelines for the management of atrial fibrillation

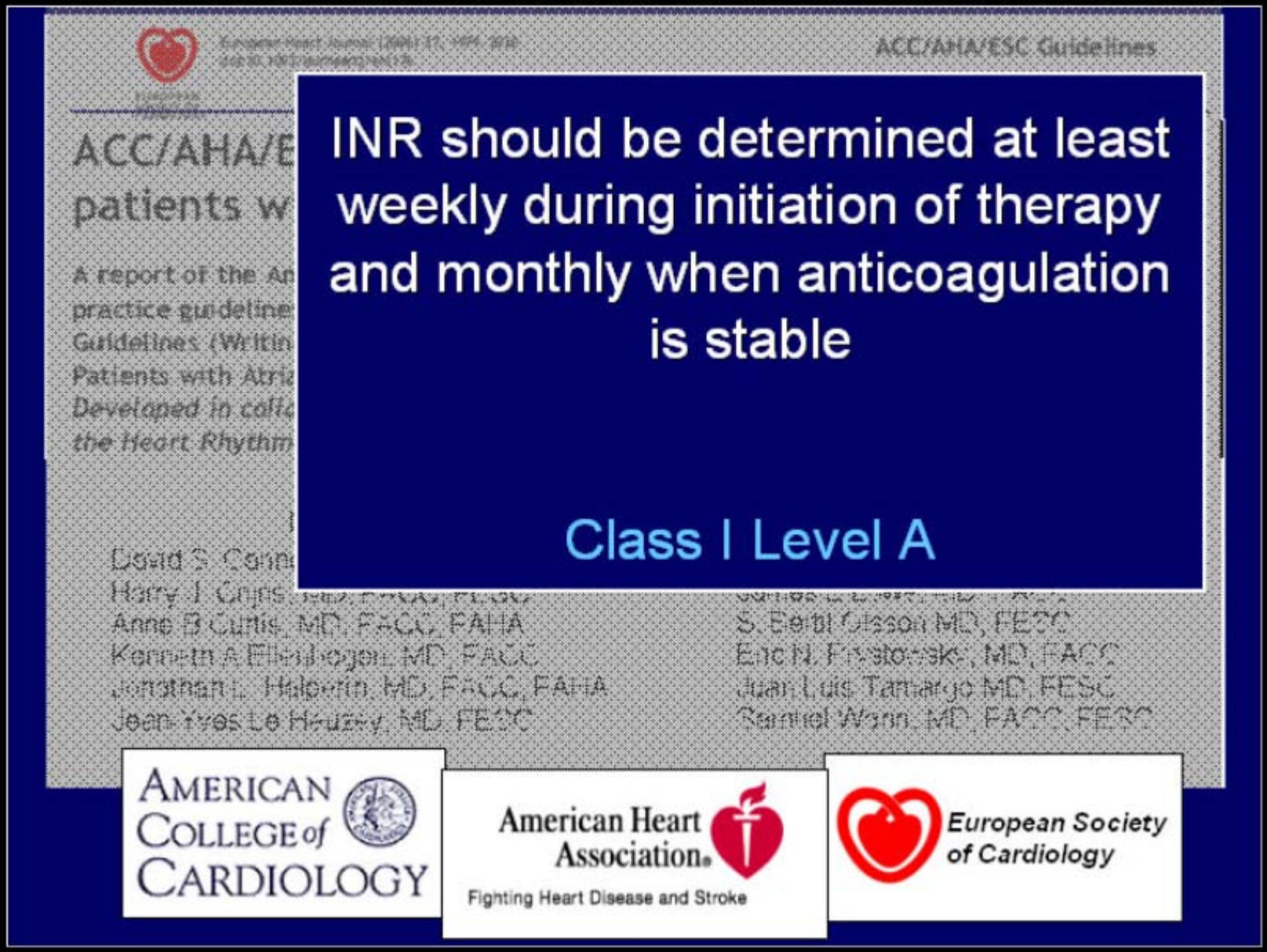
Suboptimal Use of Anticoagulation in Patients With AF

Warfarin Use in Eligible Patients

At hospital discharge	38–44%
In nursing homes	20–32%
In community settings	11–32%

(Stafford, Singer Circulation 1998; 97:1231)

(Frykman, Rydén, Rosenqvist Europ Heart J 2001)


ACC/AHA/ESC Guidelines
INR should be determined at least weekly during initiation of therapy and monthly when anticoagulation is stable
Class I Level A
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American Heart Association
Fighting Heart Disease and Stroke
European Society of Cardiology

Treatment for paroxysmal AF

Patients with paroxysmal AF can be highly symptomatic

Three main aims of treatment for paroxysmal AF are to:

- suppress paroxysms of AF and maintain sinus rhythm
- control heart rate during paroxysms of AF
- prevent complications

Treatment strategies include out-of-hospital initiation of antiarrhythmic drugs: ‘pill in the pocket’ approach

Patients with paroxysmal AF carry the same risks of stroke and thromboembolism as those with persistent AF

CARDIOVERSION ELECTRICA

Cardioversion

Cardioversion is performed as part of a rhythm-control treatment strategy

There are two types of cardioversion: electrical (ECV) and pharmacological (PCV)

Cardioversion of AF is associated with increased risk of stroke in the absence of antithrombotic therapy

Not all attempts at ECV or PCV are successful

Patient choice is important

Direct-current cardioversion of atrial fibrillation: recommendations

Class I

1. When a rapid ventricular response to AF does not respond promptly to pharmacological measures, immediate direct-current cardioversion is recommended for patients with myocardial ischaemia, symptomatic hypotension, angina, or HF (LEVEL C)
2. Immediate direct-current cardioversion is recommended for patients with pre-excitation when AF occurs with extreme tachycardia or haemodynamic instability (LEVEL B)
3. Cardioversion is recommended when symptoms of AF are unacceptable to the patient. In case of relapse, direct-current cardioversion may be repeated following administration of antiarrhythmic medication (LEVEL C)

Class IIa

1. Direct-current cardioversion can be useful to restore sinus rhythm as part of a long-term management strategy for patients with AF (LEVEL B)
2. Patient preference is a reasonable consideration in the selection of infrequently repeated cardioversions for the management of symptomatic or recurrent AF (LEVEL C)

Class III

1. Frequent direct-current cardioversion is not recommended for patients with relatively short periods of sinus rhythm after multiple cardioversion procedures despite prophylactic antiarrhythmic drug therapy (LEVEL C)
2. Electrical cardioversion is contraindicated in patients with digitalis toxicity or hypokalemia (LEVEL C)

Comparación de onda monofásica y bifásica en la cardioversión eléctrica de la fibrilación auricular

T. MUÑOZ MARTÍNEZ, Y. POVEDA HERNÁNDEZ, J.L. DUDAGOITIA OTAOLEA, S. MARTÍNEZ ALÚTIZ, C. VINUESA LOZANO, M. HERNÁNDEZ LÓPEZ Y S. IRIBARREN DIARASARRI

TABLA 2. **Variables relacionadas con la cardioversión**

	Choque monofásico (n = 58)	Choque bifásico (n = 50)	Significación
Reversión a RS	49 (84%)	48 (96%)	p = 0,04
Nº de choques*	1 (1-5)	1 (1-3)	NS
RS al primer choque	31 (63%)	37 (77%)	NS
Energía (J)*	200 (200-360)	150 (150-200)	p < 0,001
Soporte hemodinámico	1	2	NS
Ventilación bolsa-mascarilla	27	28	NS

*Mediana (rango). RS: ritmo sinusal.

Prevention of thromboembolism in patients with atrial fibrillation undergoing cardioversion: recommendations (1)

Class I

1. For patients with AF of 48 h duration or longer, or when the duration of AF is unknown, anticoagulation (INR 2.0 to 3.0) is recommended for at least 3 weeks prior to and 4 weeks after cardioversion, regardless of the method used to restore sinus rhythm (LEVEL B)
2. For patients with AF of more than 48 h duration requiring immediate cardioversion because of haemodynamic instability, heparin should be administered concurrently by an initial intravenous injection followed by a continuous infusion (aPTT 1.5 to 2 times control). Thereafter oral anticoagulation (INR 2.0 to 3.0) should be provided for at least 4 weeks, as for elective cardioversion. Limited data support subcutaneous low molecular weight heparin (LEVEL C)
3. For patients with AF of less than 48 h duration associated with haemodynamic instability, cardioversion should be performed immediately without anticoagulation (LEVEL C)

Class IIa

1. During the 48 h after onset of AF, the need for anticoagulation before and after cardioversion may be based on the patient's risk of thromboembolism (LEVEL C)
2. As an alternative to anticoagulation prior to cardioversion of AF, it is reasonable to perform transoesophageal echocardiography in search of thrombus (LEVEL B)

Follow-up and referral

Follow-up after cardioversion should take place at 1 month, and the frequency of subsequent reviews should be tailored to the patient

Reassess the need for anticoagulation at each review

Referral for further specialist intervention should be considered in patients:

- in whom pharmacological therapy has failed
- with lone AF
- with ECG evidence of any underlying electrophysiological disorder

“CIRUGIA” DE LA FA

OP. DEL CORREDOR

OP. DEL LABERINTO (MAZE)

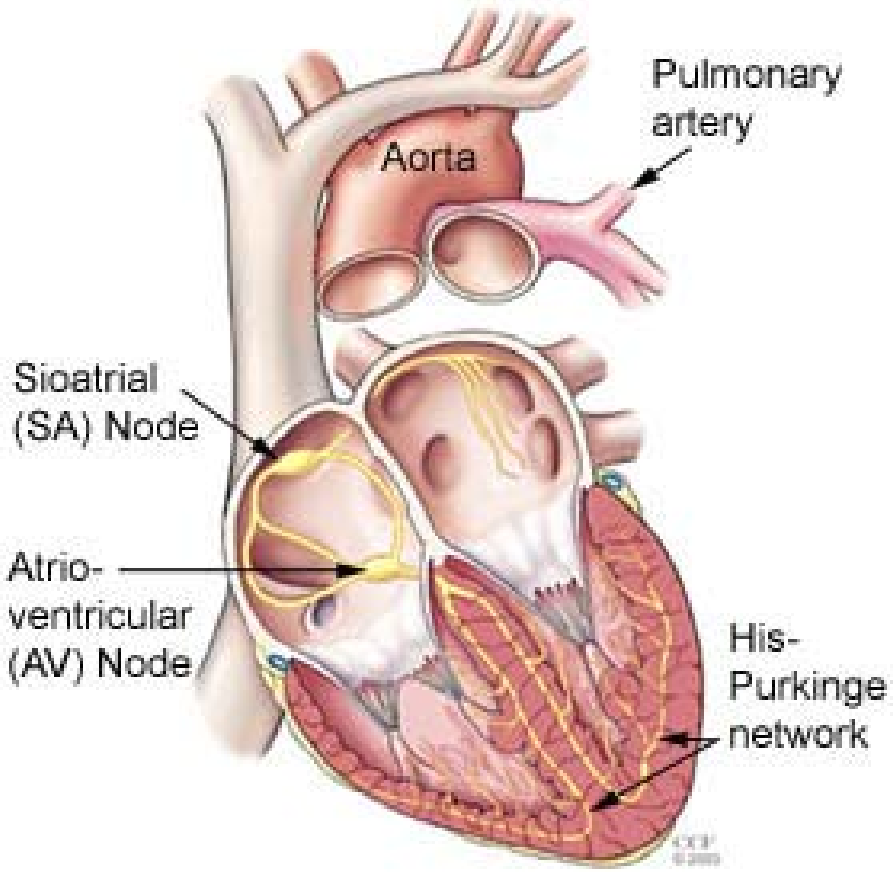
ABLACION CON RADIOFRECUENCIA, CRIOTERMIA, MICROONDAS, U.S. Y LASER. MCP

PVAI. CATETERISMO TRANSEPTAL

DESFIBRILADOR AURICULAR IMPLANTABLE

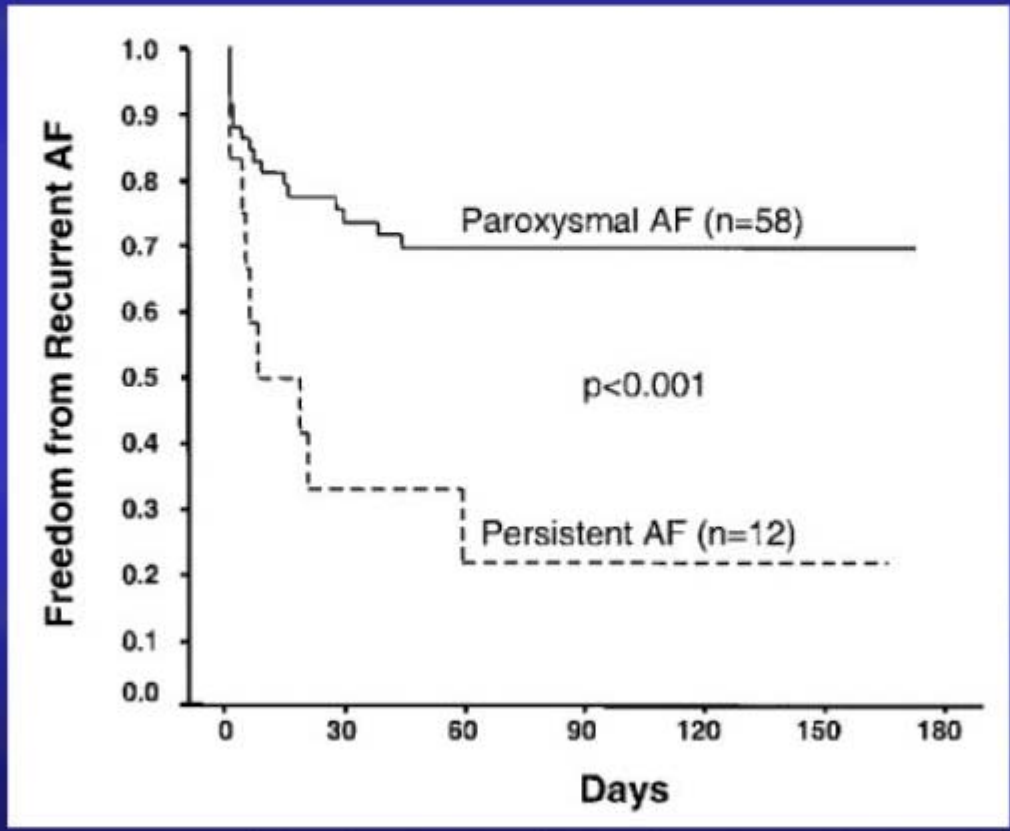
ABLACION DE H. DE KENT EN WPW

PVAI


Pulmonary artery
Aorta
Sioatrial (SA) Node
Atrio-ventricular (AV) Node
His-Purkinge network

Technolgical support for the anatomic approach

Pulmonary veins isolation for persistent/permanent AF



Oral et al. Circulation. 2002;105:1077-81

DESFIBRILADORES AURICULARES IMPLANTABLES

LA F.A. GENERA MÁS FA.

PROBLEMA:

MOLESTOS, 3 JULIOS, CON MAS DE 1 JULIO SE SIENTE EL DISPARO

ACC/AHA/ESC 2006 guidelines for the management of atrial fibrillation

Changes since the 2001 version

Patients with AF in special circumstances

Data more robust permitting recommendations based on a higher level of evidence

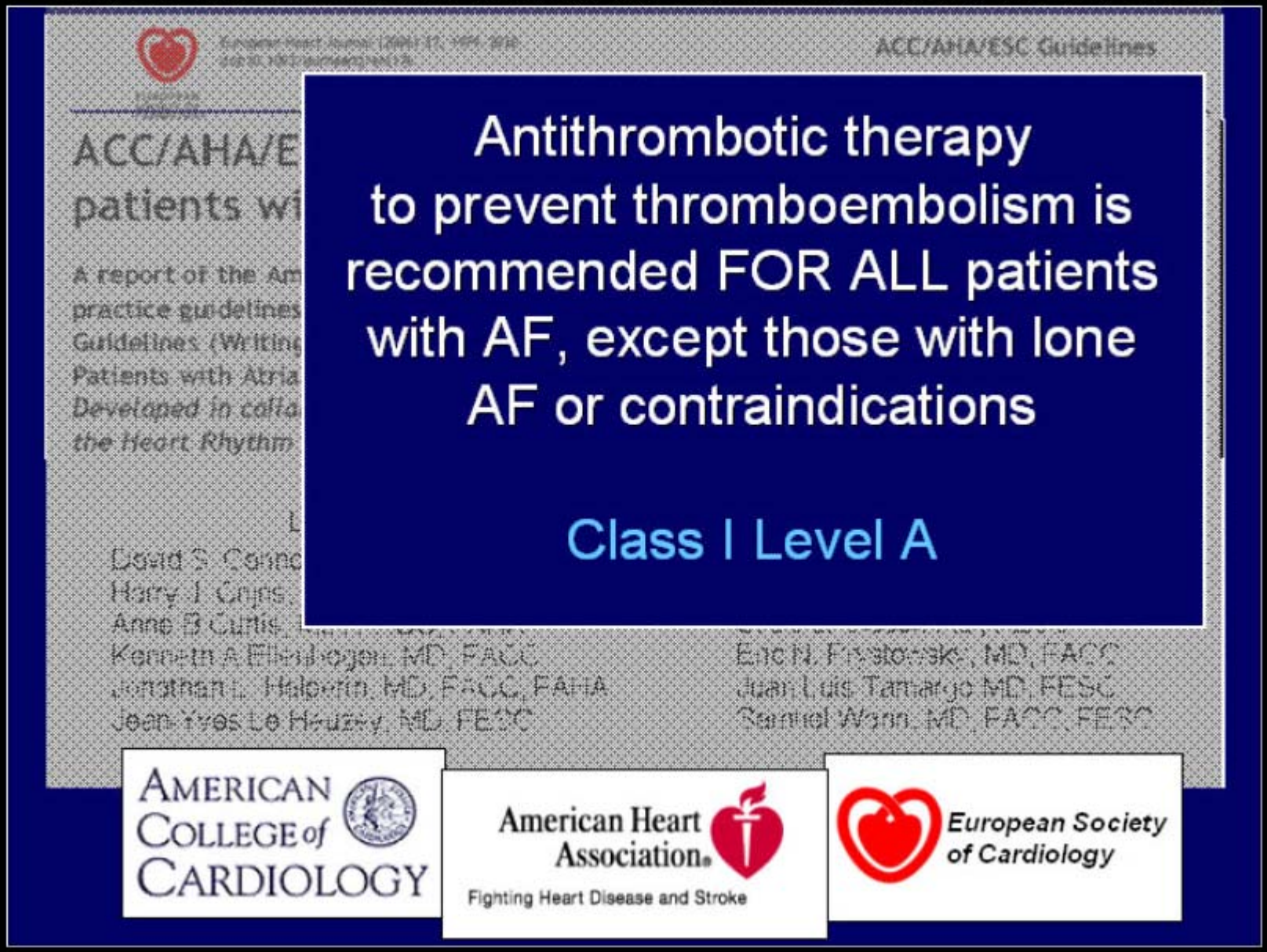
Conditions considered

Postoperative AF
The WPW syndrome
Hyperthyroidism
Pregnancy
Hypertrophic cardiomyopathy

Hyperthyroidism: recommendations

Class I

1. A beta-blocker is recommended to control the heart rate in patients with AF complicating thyrotoxicosis, unless contraindicated (LEVEL B)
2. When a beta-blocker cannot be used, a nondihydropyridine calcium channel antagonist is recommended to control the ventricular rate in patients with AF and thyrotoxicosis (LEVEL B)
3. In patients with AF and thyrotoxicosis, oral anticoagulation (INR 2.0 to 3.0) is recommended (LEVEL C)
4. Once euthyroid state is achieved, antithrombotic prophylaxis is the same as for patients without hyperthyroidism (LEVEL C)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Postoperative atrial fibrillation: recommendations

Class I

1. Unless contraindicated, an oral beta-blocker is recommended to prevent postoperative AF for patients undergoing cardiac surgery (LEVEL A)
2. AV nodal blocking agents are recommended for rate control in patients who develop postoperative AF (LEVEL B)

Class IIa

1. Preoperative amiodarone reduces the incidence of AF in patients undergoing cardiac surgery and represents appropriate prophylactic therapy for patients at high risk for postoperative AF (LEVEL A)
2. It is reasonable to restore sinus rhythm by pharmacological cardioversion with ibutilide or direct-current cardioversion in patients who develop postoperative AF (LEVEL B)
3. Antiarrhythmic medication is reasonable to maintain sinus rhythm in patients with recurrent or refractory postoperative AF (LEVEL B)
4. Antithrombotic medication is reasonable in patients who develop postoperative AF (LEVEL B)

Class IIb

1. Prophylactic sotalol may be considered for patients at risk of developing AF following cardiac surgery (LEVEL B)

Acute myocardial infarction: recommendations

Class I

1. Direct-current cardioversion is recommended for patients with severe haemodynamic compromise, intractable ischaemia, or when adequate rate control cannot be achieved with pharmacological agents in patients with acute MI and AF (LEVEL C)
2. Intravenous amiodarone is recommended to slow a rapid ventricular response to AF and improve LV function in patients with acute MI (LEVEL C)
3. Intravenous beta-blockers and nondihydropyridine calcium antagonists are recommended to slow a rapid ventricular response to AF in patients with acute MI who do not have LV dysfunction, bronchospasm, or AV block (LEVEL C)
4. For patients with AF and acute MI, unfractionated heparin is recommended (aPTT 1.5 to 2.0 times control), unless contraindicated (LEVEL C)

Class IIa

1. Intravenous digitalis is reasonable to slow a rapid ventricular response and improve LV function in patients with acute MI and AF associated with severe LV dysfunction and HF (LEVEL C)

Class III

1. Class IC antiarrhythmic drugs are not recommended in patients with AF and acute MI (LEVEL C)

Management of atrial fibrillation during pregnancy: recommendations

Class I

1. Digoxin, a beta-blocker, or nondihydropyridine calcium channel antagonists are recommended to control the ventricular rate in pregnant patients with AF (LEVEL C)
2. Direct-current cardioversion is recommended in pregnant patients who become haemodynamically unstable due to AF (LEVEL C)
3. Protection against thromboembolism is recommended throughout pregnancy for patients with AF except those at low thromboembolic risk. The choice of anticoagulant or aspirin should be chosen according to the stage of pregnancy (LEVEL C)

Class IIb

1. During the first trimester and last month of pregnancy for patients with AF and risk factors for thromboembolism, consider administering unfractionated heparin by continuous intravenous infusion (aPTT 1.5 to 2 times control) or by subcutaneous injection (10 000 to 20 000 units every 12 h, adjusted to prolong the aPTT 6 h after injection to 1.5 times control (LEVEL B)
2. During the first trimester and last month of pregnancy subcutaneous low molecular weight heparin may be considered for patients with AF and risk factors for thromboembolism despite limited data (LEVEL C)
3. During the second trimester, consider oral anticoagulation for pregnant women with AF at high thromboembolic risk (LEVEL C)
4. Quinidine or procainamide may be considered for pharmacological cardioversion in haemodynamically stable patients who develop AF during pregnancy (LEVEL C)

Management of atrial fibrillation in patients with pulmonary disease: recommendations

Class I

1. For patients who develop AF during an acute pulmonary illness or exacerbation of chronic pulmonary disease, correction of hypoxaemia and acidosis is the primary therapeutic measure (LEVEL C)
2. Diltiazem or verapamil is recommended to control the ventricular rate in patients with obstructive pulmonary disease who develop AF (LEVEL C)
3. Direct-current cardioversion should be attempted in patients with pulmonary disease who become haemodynamically unstable as a consequence of AF (LEVEL C)

Class III

1. Theophylline and beta-adrenergic agonist agents are not recommended in patients with bronchospastic lung disease who develop AF (LEVEL C)
2. Beta-blockers, sotalol, propafenone, and adenosine are not recommended in patients with obstructive lung disease who develop AF (LEVEL C)

Guía de la SEC

TABLA 11. **Tratamiento farmacológico de la fibrilación auricular**

Tipo	Estrategia terapéutica	Fármacos antiarrítmicos	Nivel de evidencia
Paroxística	*1.* Restablecer el RS. Cardioversión farmacológica si no hay reversión espontánea	FAA IC i.v. o v.o.	Grado A
		Procainamida i.v.	Grado B
		Procainamida o IC en síndrome WPW	Grado B
		Amiodarona si los FAA I están contraindicados	Grado B
	2. Prevención de recurrencias	FAA IC	Grado B
		Amiodarona de elección si hay cardiopatía estructural	Grado B
		Sotalol	Grado B
		Flecainida en FA vagal	Grado B
		β-bloqueadores en FA catecolamín-dependiente	Grado B
	3. Control de la FC durante los paroxismos	β-bloqueadores	Grado B
		Antagonistas del calcio	
		Digital	
Persistente	*1.* Restablecer el ritmo sinusal	Cardioversión eléctrica	Grado A
	2. Prevención de recurrencias	FAA IC (no si hay cardiopatía estructural)	Grado B
		Sotalol	Grado B
		Amiodarona (de elección si hay cardiopatía estructural)	Grado B
Permanente o crónica	*1.* Control de la FC si no ha sido posible restablecer el RS	β-bloqueadores ±	
		Calcioantagonistas ±	Grado A
		Digital	
Posquirúrgica	*1.* Prevención de FA	β-bloqueadores	Grado A
		FAA III: sotalol, amiodarona	Grado B
	2. Restablecer el RS	FAA IC	Grado A

FAA: fármacos antiarrítmicos; FA: fibrilación auricular; FC: frecuencia cardíaca; RS: ritmo sinusal; WPW: Wolff-Parkinson-White.

Recommendations for pharmacological cardioversion of atrial fibrillation present for more than 7 days duration

Drug*	Route of administration	Class of recommendation	Level of evidence
Agents with proven efficacy			
Dofetilide	Oral	I	A
Amiodarone	Oral or IV	IIa	A
Ibutilide	IV	IIa	A
Less effective or incompletely studied agents			
Disopyramide	IV	IIb	B
Flecainide	Oral	IIb	B
Procainamide	IV	IIb	C
Propafenone	Oral or IV	IIb	B
Quinidine	Oral	IIb	B
Should not be administered			
Digoxin	Oral or IV	III	B
Sotalol	Oral or IV	III	B

* The doses of medications used in these studies may not be the same as those recommended by the manufacturers. Drugs are listed alphabetically within each category of recommendation and level of evidence. IV = intravenous.

ACC/AHA/ESC 2006 guidelines for the management of atrial fibrillation

Antiarrhythmic drug therapy to maintain sinus rhythm in patients with paroxysmal or persistent atrial fibrillation