Bringing the New EHRA/HRS Guidelines to Daily Clinical Practice

Hugh Calkins MD
Nicholas J Fortuin Professor of Cardiology
Professor of Medicine
Director of Electrophysiology
Johns Hopkins Medical Institutions

Conflict of Interest

No conflicts to declare.

Europace (2012) **14**, 528–606
doi:10.1093/europace/eus027

HRS/EHRA/ECAS EXPERT CONSENSUS STATEMENT

2012 HRS/EHRA/ECAS Expert Consensus Statement on Catheter and Surgical Ablation of Atrial Fibrillation: Recommendations for Patient Selection, Procedural Techniques, Patient Management and Follow-up, Definitions,

European Heart Journal
doi:10.1093/eurheartj/ehs253

ESC GUIDELINES

2012 focused update of the ESC Guidelines for the management of atrial fibrillation

An update of the 2010 ESC Guidelines for the management of atrial fibrillation
Developed with the special contribution of the European Heart Rhythm Association

Authors/Task Force Members: A. John Camm (Chairperson) (UK)*, Gregory Y.H. Lip (UK), Raffaele De Caterina (Italy), Irene Savelieva (UK), Dan Atar (Norway), Stefan H. Hohnloser (Germany), Gerhard Hindricks (Germany), Paulus Kirchhof (UK)

Bringing the New EHRA/HRS Guidelines to Daily Clinical Practice

2012 HRS/EHRA/ECAS Expert Consensus Statement on Catheter and Surgical Ablation of Atrial Fibrillation: Recommendations for Patient Selection, Procedural Techniques, Patient Management and Follow-up, Definitions, Endpoints, and Research Trial Design

Hugh Calkins, MD, FACC, FHRS, FAHA; Karl Heinz Kuck, MD, FESC; Riccardo Cappato, MD, FESC; Josep Brugada, MD, FESC; A. John Camm, MD, PhD; Shih-Ann Chen, MD, FHRS[§]; Harry J.G. Crijns, MD, PhD, FESC; Ralph J. Damiano, Jr., MD[^]; D. Wyn Davies, MD, FHRS; John DiMarco, MD, PhD, FACC, FHRS; James Edgerton, MD, FACC, FACS, FACCP[^]; Kenneth Ellenbogen, MD, FHRS; Michael D. Ezekowitz, MD; David E. Haines, MD, FHRS; Michel Haissaguerre, MD; Gerhard Hindricks, MD; Yoshito Iesaka, MD[§]; Warren Jackman, MD, FHRS; Jose Jalife, MD, FHRS; Pierre Jais, MD; Jonathan Kalman, MD[§]; David Keane, MD; Young-Hoon Kim, MD, PhD[§]; Paulus Kirchhof, MD; George Klein, MD; Hans Kottkamp, MD; Koichiro Kumagai, MD, PhD[§]; Bruce D. Lindsay, MD, FHRS[∞]; Moussa Mansour, MD; Francis E. Marchlinski, MD; Patrick M. McCarthy, MD[^]; J. Lluis Mont, MD, FESC; Fred Morady, MD; Koonlawee Nademanee, MD; Hiroshi Nakagawa, MD, PhD, Andrea Natale, MD, FHRS[i]; Stanley Nattel, MD; Douglas L. Packer, MD, FHRS; Carlo Pappone, MD, PhD; Eric Prystowsky, MD, FHRS; Antonio Raviele, MD, FESC; Vivek Reddy, MD; Jeremy N. Ruskin, MD; Richard J. Shemin, MD[^]; Hsuan-Ming Tsao, MD[§]; David Wilber, MD

Heart Rhythm, EuroPace, JICE March 1, 2012

2012 HRS/ EHRA/ ECAS EXPERT CONSENSUS STATEMENT ON CATHETER AND SURGICAL ABLATION OF ATRIAL FIBRILLATION

- Comprehensive state of the art review of the field of catheter and surgical ablation of atrial fibrillation
- Reports the findings of a Task Force convened by HRS, EHRA, and ECAS charged with defining the indications, techniques, and outcomes of these procedures
- This document also makes recommendations concerning research trial design and definitions for use in clinical trials and in the reporting of outcomes of AF ablation
- Written as a joint partnership between HRS, EHRA and ECAS
- Written in Collaboration with / endorsed by APHRS, AHA, ACC, STS
- 47 authors, 86 pages, 3 figures, 6 tables, 736 references

HRS/ EHRA/ ECAS EXPERT CONSENSUS STATEMENT ON CATHETER AND SURGICAL ABLATION OF ATRIAL FIBRILLATION – 11 SECTIONS

- AF Definitions, Mechanisms, and Rationale for Ablation
- Indications for Catheter and Surgical Ablation of Atrial Fibrillation
- Techniques and endpoints for AF ablation
- Technologies and tools
- Other technical aspects; anticoag, anesthesia, esoph monitoring
- Follow-up considerations
- Outcomes and efficacy of AF ablation
- Complications
- Training requirements and competencies
- Surgical ablation of AF
- Clinical trial considerations and definitions

HRS/ EHRA/ ECAS EXPERT CONSENSUS STATEMENT ON CATHETER AND SURGICAL ABLATION OF ATRIAL FIBRILLATION – 11 SECTIONS

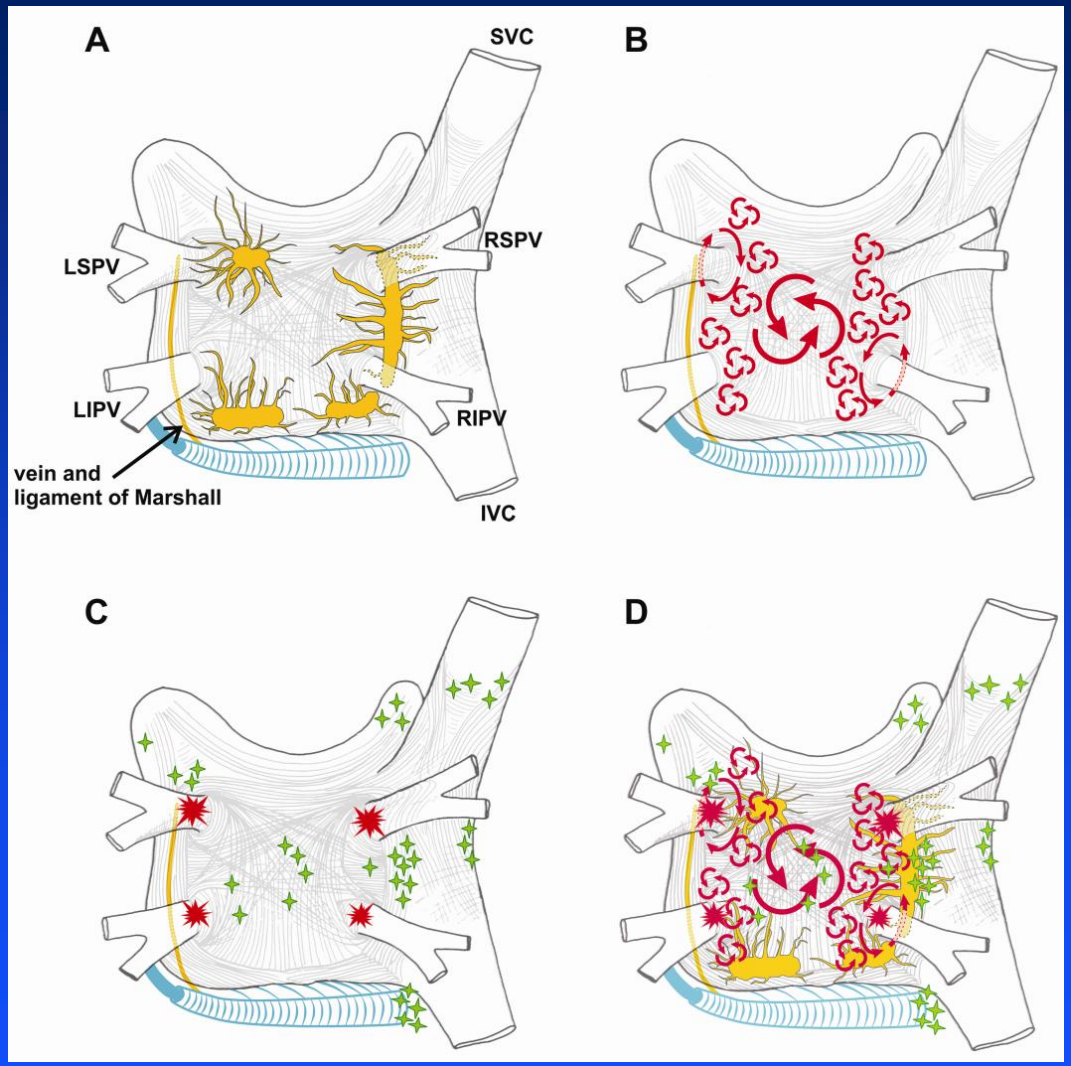
- AF Definitions, Mechanisms, and Rationale for Ablation
- Indications for Catheter and Surgical Ablation of Atrial Fibrillation
- Techniques and endpoints for AF ablation
- Technologies and tools
- Other technical aspects; anticoag, anesthesia, esoph monitoring
- Follow-up considerations
- Outcomes and efficacy of AF ablation
- Complications
- Training requirements and competencies
- Surgical ablation of AF
- Clinical trial considerations and definitions

AF Definitions, Mechanisms, and Rationale for Ablation

Table 1 Types and classification of atrial fibrillation**

Atrial Fibrillation Episode	An atrial fibrillation episode is defined as AF that is documented by ECG monitoring and has a duration of at least 30 seconds, or if less than 30 seconds, is present continuously throughout the ECG monitoring tracing. The presence of subsequent episodes of AF requires that sinus rhythm be documented by ECG monitoring between AF episodes.
Paroxysmal AF*	Paroxysmal AF is defined as recurrent AF (≥2 episodes) that terminates spontaneously within 7 days. Episodes of AF of ≤ 48 hours' duration that are terminated with electrical or pharmacologic cardioversion should also be classified as paroxysmal AF episodes.
Persistent AF*	Persistent AF is defined as continuous AF that is sustained beyond seven days. Episodes of AF in which a decision is made to electrically or pharmacologically cardiovert the patient after ≥ 48 hours of AF, but prior to 7 days, should also be classified as persistent AF episodes.
Longstanding Persistent AF	Longstanding persistent AF is defined as continuous AF of greater than 12 months' duration.
Permanent AF	The term permanent AF is not appropriate in the context of patients undergoing catheter or surgical ablation of AF, as it refers to a group of patients for which a decision has been made not to restore or maintain sinus rhythm by any means, including catheter or surgical ablation. If a patient previously classified as having permanent AF is to undergo catheter or surgical ablation, the AF should be reclassified.

Structure and Mechanisms of AF



2012

Indications for Catheter Ablation of Atrial Fibrillation

Indications for catheter ablation of AF	Class	Level
Symptomatic AF refractory or intolerant to at least one Class 1 or 3 antiarrhythmic medication		
Paroxysmal: Catheter ablation is recommended*	I	A
Persistent: Catheter ablation is reasonable	IIa	B
Longstanding Persistent: Catheter ablation may be considered	IIb	B
Symptomatic AF prior to initiation of antiarrhythmic drug therapy with a Class 1 or 3 antiarrhythmic agent		
Paroxysmal: Catheter ablation is reasonable	IIa	B
Persistent: Catheter ablation may be considered	IIb	C
Longstanding Persistent: Catheter ablation may be considered	IIb	C

Indications for Concomitant Surgical Ablation of Atrial Fibrillation

Indications for concomitant surgical ablation of AF		
Symptomatic AF refractory or intolerant to at least one Class 1 or 3 antiarrhythmic medication		
Paroxysmal: Surgical ablation is reasonable for patients undergoing surgery for other indications	IIa	C
Persistent: Surgical ablation is reasonable for patients undergoing surgery for other indications	IIa	C
Longstanding Persistent: Surgical ablation is reasonable for patients undergoing surgery for other indications	IIa	C
Symptomatic AF prior to initiation of antiarrhythmic drug therapy with a Class 1 or 3 antiarrhythmic agent		
Paroxysmal: Surgical ablation is reasonable for patients undergoing surgery for other indications	IIa	C
Persistent: Surgical ablation is reasonable for patients undergoing surgery for other indications	IIa	C
Longstanding Persistent: Surgical ablation may be considered for patients undergoing surgery for other indications	IIb	C

Indications for Stand Alone Surgical Ablation of Atrial Fibrillation

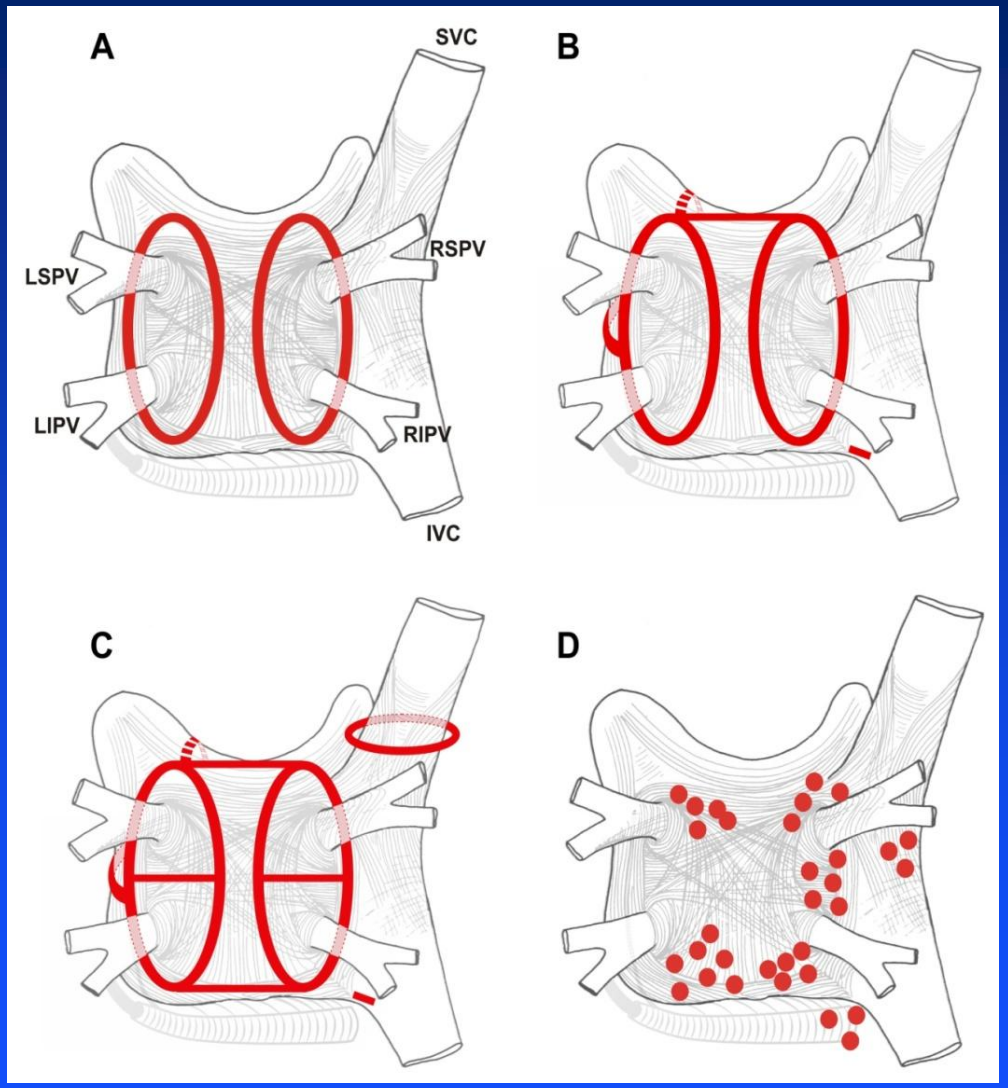
Indications for stand alone surgical ablation of AF		
Symptomatic AF refractory or intolerant to at least one Class 1 or 3 antiarrhythmic medication		
Paroxysmal: Stand alone surgical ablation may be considered for patients who have not failed catheter ablation but prefer a surgical approach	IIb	C
Paroxysmal: Stand alone surgical ablation may be considered for patients who have failed one or more attempts at catheter ablation	IIb	C
Persistent: Stand alone surgical ablation may be considered for patients who have not failed catheter ablation but prefer a surgical approach	IIb	C
Persistent: Stand alone surgical ablation may be considered for patients who have failed one or more attempts at catheter ablation	IIb	C
Longstanding Persistent: Stand alone surgical ablation may be considered for patients who have not failed catheter ablation but prefer a surgical approach	IIb	C
Longstanding Persistent: Stand alone surgical ablation may be considered for patients who have failed one or more attempts at catheter ablation	IIb	C
Symptomatic AF prior to initiation of antiarrhythmic drug therapy with a Class 1 or 3 antiarrhythmic agent		
Paroxysmal: Stand alone surgical ablation is not recommended	III	C
Persistent: Stand alone surgical ablation is not recommended	III	C
Longstanding Persistent: Stand alone surgical ablation is not recommended	III	C

Recommendations Regarding Ablation Technique

Table 3 Recommendations regarding ablation technique

- Ablation strategies that target the PVs and/or PV antrum are the cornerstone for most AF ablation procedures.
- If the PVs are targeted, electrical isolation should be the goal.
- Achievement of electrical isolation requires, at a minimum, assessment and demonstration of entrance block into the PV.
- Monitoring for PV reconduction for 20 minutes following initial PV isolation should be considered.
- For surgical PV isolation, entrance and/or exit block should be demonstrated.
- Careful identification of the PV ostia is mandatory to avoid ablation within the PVs.
- If a focal trigger is identified outside a PV at the time of an AF ablation procedure, ablation of that focal trigger should be considered.
- If additional linear lesions are applied, operators should consider using mapping and pacing maneuvers to assess for line completeness.
- Ablation of the cavotricuspid isthmus is recommended in patients with a history of typical atrial flutter or inducible cavotricuspid isthmus dependent atrial flutter.
- If patients with longstanding persistent AF are approached, operators should consider more extensive ablation based on linear lesions or complex fractionated electrograms.
- It is recommended that RF power be reduced when creating lesions along the posterior wall near the esophagus.

Schematic of Common Lesion Sets Employed in AF Ablation



Anticoagulation Strategies pre Ablation

Table 4 Anticoagulation strategies: Pre, during, and post ablation

Pre Ablation

- Anticoagulation guidelines that pertain to cardioversion of AF be adhered to in patients who present for an AF ablation in atrial fibrillation at the time of the procedure. In other words, if the patient has been in AF for 48 hours or longer or for an unknown duration, we require three weeks of systemic anticoagulation at a therapeutic level prior to the procedure, and if this is not the case, we advise that a TEE be performed to screen for thrombus. Furthermore, each of these patients will be anticoagulated systemically for two months post ablation.
- Prior to undergoing an AF ablation procedure a TEE should be performed in all patients with atrial fibrillation more than 48 hours in duration or of an unknown duration if adequate systemic anticoagulation has not been maintained for at least 3 weeks prior to the ablation procedure.
- Performance of a TEE in patients who are in sinus rhythm at the time of ablation or patients with AF who are in AF but have been in AF for 48 hours or less prior to AF ablation may be considered but is not mandatory.
- The presence of a left atrial thrombus is a contraindication to catheter ablation of AF.
- Performance of catheter ablation of AF on a patient who is therapeutically anticoagulated with warfarin should be considered.

Anticoagulation Strategies Post Ablation

Post Ablation

- In patients who are not therapeutically anticoagulated with warfarin at the time of AF ablation, low molecular weight heparin or intravenous heparin should be used as a bridge to resumption of systemic anticoagulation with warfarin following AF ablation.
- Initiation of a direct thrombin or Factor Xa inhibitor after ablation may be considered as an alternative post procedure anticoagulation strategy.
- Because of the increased risk of post procedure bleeding on full dose low molecular weight heparin (1 mg/kg bid) a reduction of the dose to 0.5 mg/kg should be considered.
- Systemic anticoagulation with warfarin or a direct thrombin or Factor Xa inhibitor is recommended for at least two months following an AF ablation procedure.
- Decisions regarding the continuation of systemic anticoagulation agents more than two months following ablation should be based on the patient's risk factors for stroke and not on the presence or type of AF.
- Discontinuation of systemic anticoagulation therapy post ablation is not recommended in patients who are at high risk of stroke as estimated by currently recommended schemes ($CHADS_2$ or CHA_2DS_2VASc)[e3].

European Heart Journal
doi:10.1093/eurheartj/ehs253

ESC GUIDELINES

2012 focused update of the ESC Guidelines for the management of atrial fibrillation

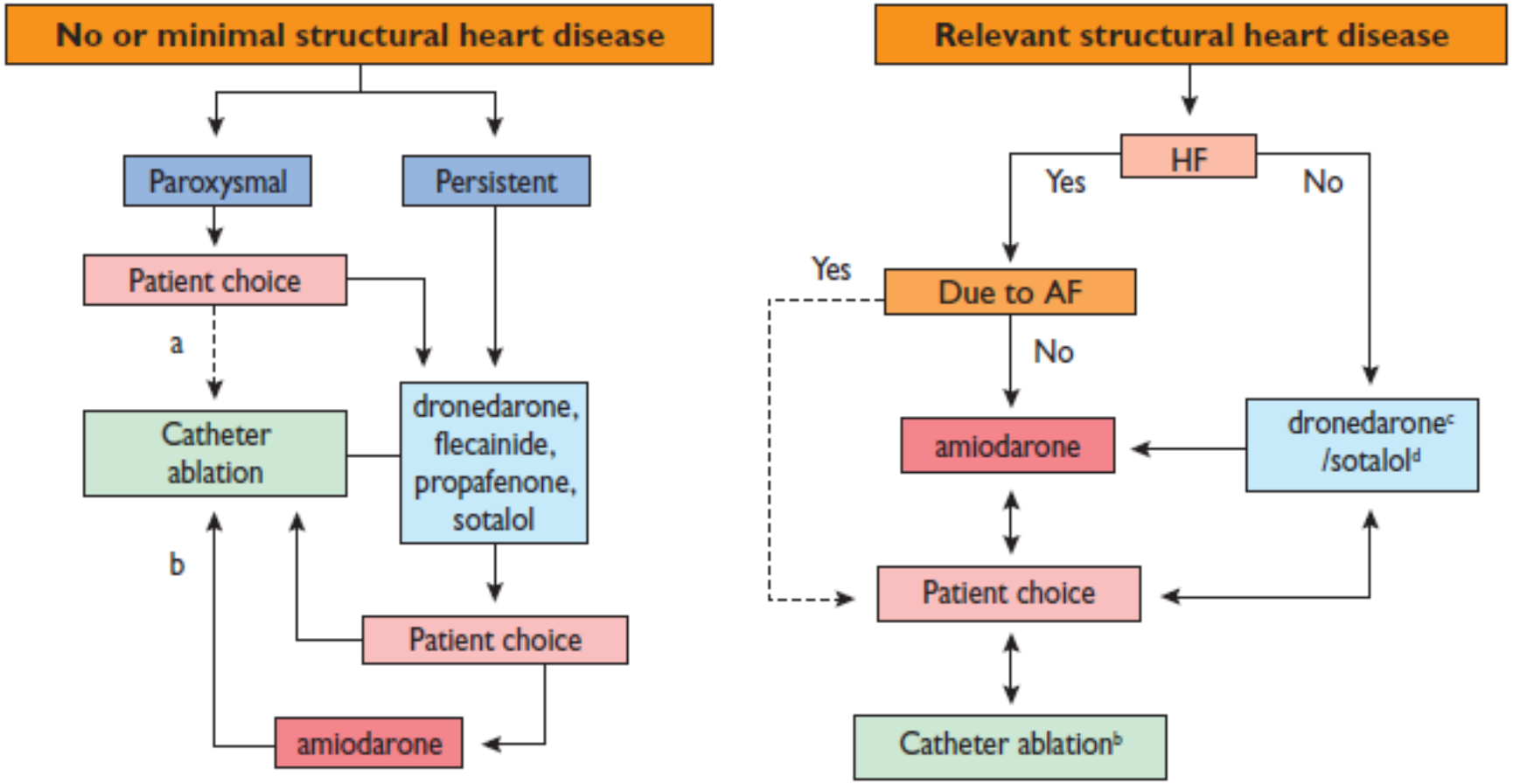
An update of the 2010 ESC Guidelines for the management of atrial fibrillation
Developed with the special contribution of the European Heart Rhythm Association

Authors/Task Force Members: A. John Camm (Chairperson) (UK)*, Gregory Y.H. Lip (UK), Raffaele De Caterina (Italy), Irene Savelieva (UK), Dan Atar (Norway), Stefan H. Hohnloser (Germany), Gerhard Hindricks (Germany), Paulus Kirchhof (UK)

Recommendations for left atrial ablation

Recommendations	Class[a]	Level[b]	Ref[c]
Catheter ablation of symptomatic paroxysmal AF is recommended in patients who have symptomatic recurrences of AF on antiarrhythmic drug therapy (amiodarone, dronedarone, flecainide, propafenone, sotalol) and who prefer further rhythm control therapy, when performed by an electrophysiologist who has received appropriate training and is performing the procedure in an experienced centre.	I	A	192, 193
Catheter ablation of AF should target isolation of the pulmonary veins.	IIa	A	170, 172, 192, 194
Catheter ablation of AF should be considered as first-line therapy in selected patients with symptomatic paroxysmal AF as an alternative to antiarrhythmic drug therapy, considering patient choice, benefit, and risk.	IIa	B	156–158
When catheter ablation of AF is planned, continuation of oral anticoagulation with a VKA should be considered during the procedure, maintaining an INR close to 2.0.	IIa	B	170, 181–184
When AF recurs within the first 6 weeks after catheter ablation, a watch-and-wait rhythm control therapy should be considered.	IIa	B	195

ESC 2012
Focused Update



AF = atrial fibrillation; HF = heart failure. [a]Usually pulmonary vein isolation is appropriate. [b]More extensive left atrial ablation may be needed. [c]Caution with coronary heart disease. [d]Not recommended with left ventricular hypertrophy. Heart failure due to AF = tachycardiomyopathy.

ESC 2012 Focused Update

12 Most Controversial Issues

1) Defining indications for catheter ablation of asymptomatic AF.
2) 30 second duration of an AF episode.
3) 3 month duration of blanking period.
4) Need for TEE prior to AF ablation.
5) Need for anticoagulation following AF ablation in patient presenting in sinus rhythm.
6) Anticoagulation of patients who are AF free following ablation.
7) Need for ICE during procedures.
8) Need for general anesthesia during procedures.
9) Role of CFAE ablation in long standing persistent AF.
10) Important of focal trigger screening and ablation
11) CHADS vs CHADSVasc
12) The role of new anticoagulants

Conclusions

- The 2012 HRS/ EHRA/ ECAS Expert Consensus Statement on catheter and surgical ablation of AF provides an up to date review of the indications, techniques, and outcomes of catheter and surgical ablation of atrial fibrillation.
- Indications for catheter and surgical ablation of AF are defined.
- Anticoagulation strategies prior to and following AF ablation are made.

Conclusion

- It is my impression that the Guidelines are being adhered to. Most patients undergoing ablation today have failed at least one antiarrhythmic medication and have symptomatic AF.

- Consistent with the guidelines, in rare situations select patients are undergoing ablation as first line therapy.

- Some asymptomatic or minimally symptomatic patients are undergoing ablation for “theoretical reasons”. In my mind this is acceptable provided adequate informed consent has been obtained and patients are aware that the only proven benefit of AF ablation is to improve quality of life.

Thank You