

Vorhofflimmern – welcher Patient profitiert von einer Ablation?

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AF-related Outcomes

AF-Related Outcome	Frequency in AF	Mechanism(s)		
Death	1.5 - 3 fold increase	Excess mortality related to: • HF, comorbidities • Stroke		
Stroke	20-30% of all ischaemic strokes, 10% of cryptogenic strokes	• Cardioembolic, or • Related to comorbid vascular atheroma		
LV dysfunction / Heart failure	In 20-30% of AF patients	• Excessive ventricular rate • Irregular ventricular contractions • A primary underlying cause of AF		
Cognitive decline /Vascular dementia	HR 1.4 / 1.6 (irrespective of stroke history)	• Brain white matter lesions, inflammation, • Hypoperfusion, • Micro-embolism	SWISSaf Swiss Atrial Fibrillation Cohort	• Related to AF burden, comorbidities, psychological functioning and medication • Distressed personality type

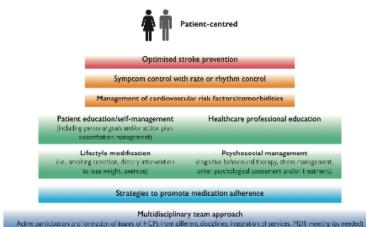
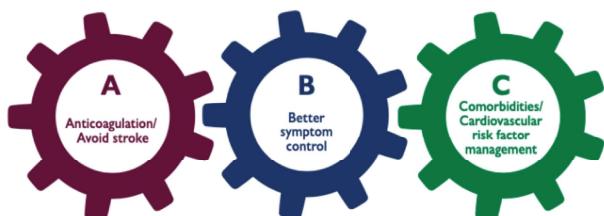
Holistic approach to management of AF

The ABC pathway:

A – Avoid stroke

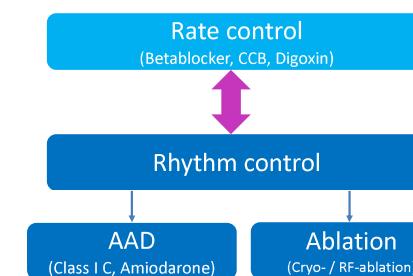
B – Better symptom control

C – Comorbidity management



ESC AF Guidelines 2020

B – Better Symptom control



The concept of PVI



Haissaguerre M, et al. NEJM 1998

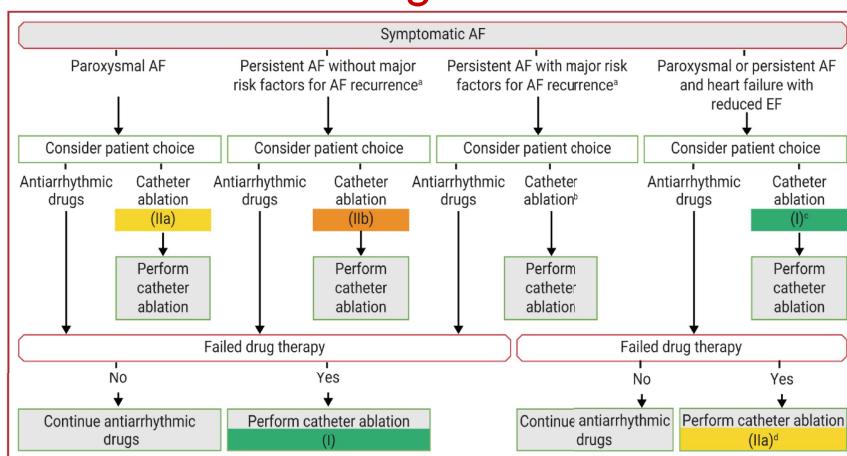
What the Guidelines recommend

Recommendations	Class*	Level ^b
Rhythm control therapy is recommended for symptom and QoL improvement in symptomatic patients with AF. ^{551–553}	I	A

But how?

ESC AF Guidelines 2020

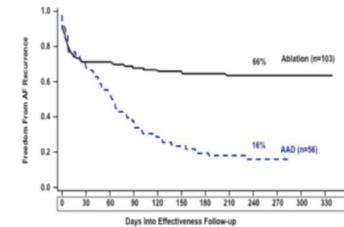
Please guide me!



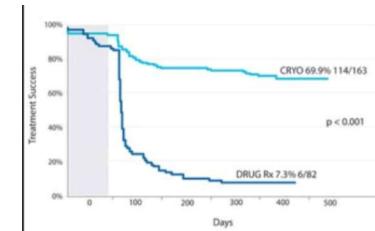
ESC Guidelines 2020

Ablation versus Antiarrhythmic drugs

Thermocool AF - Radiofrequency



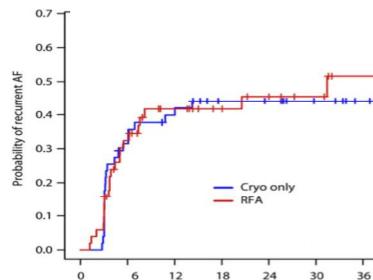
STOP AF - Cryoballoon



Wilber D, JAMA 2010
Packer D, JACC 2013

Single-procedure success rate of PVI: Cryo or RFA?

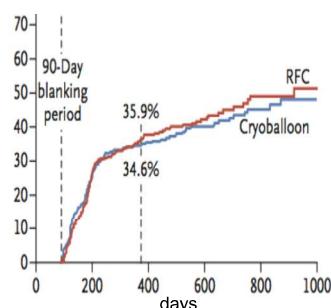
Propensity-score matched analysis



Success when including repeat procedures:

RFA 86%
Cryo 93%

Fire and Ice (RCT)



Kuck KH, et al. N Engl J Med 2016

Patient selection for catheter ablation

Assess factors favouring rhythm-control:

- Younger age
- 1st AF episode or short history
- Tachycardia-mediated cardiomyopathy
- Normal - moderate increased LAVI / atrial conduction delay (limited atrial remodeling)
- No or few comorbidities / heart disease
- Rate control difficult to achieve
- AF precipitated by a temporary event (acute illness)
- Patient's choice

ESC Guidelines 2020

Duration >2 yrs predicts failure

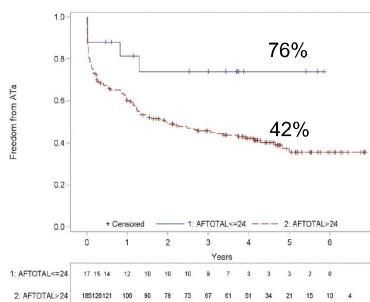


Figure 4 | Multiple Procedure Success for Patients With Total AF Duration < 2 Years Versus ≥ 2 Years

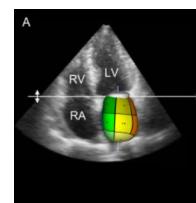
Tilz R et al., J Am Coll Cardiol 2012;60:1921

Predictors for recurrence after PVI

„The rhythm outcome after catheter ablation of AF is difficult to predict in individual patients“
(ESC Guidelines)

Value of anatomy

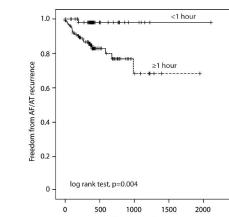
n=276, Mean LAVI: $42 \pm 13 \text{ ml/m}^2$



3D-LAVI predictor for single procedure success

Value of symptoms

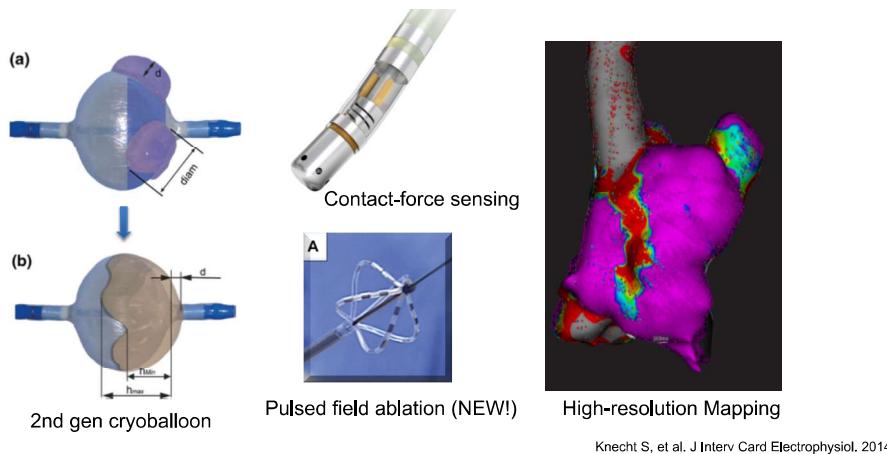
n=210



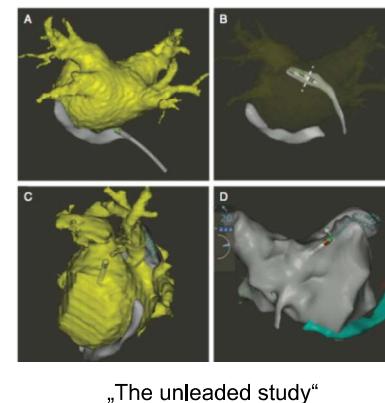
Short-lasting episodes predictor for success

Bosshard M, et al. J Cardiovasc Electrophysiol 2017
Pradella M, et al. J Cardiol 2019
Knecht S, et al. Europace 2018

Developments/New Technologies



Procedure optimization: Radiation dose (RFA)



Fluoroscopy time:
4.2 (2.6-5.6) min.

In PFO patients:
0 min. fluoroscopy time

Knecht S, et al. Europace 2015
Kühne M et al. PLoS One. 2016

Procedure optimization (Cryo)



Standard group (<i>n</i> = 25)	NC group (<i>n</i> = 75)	<i>P</i> -value
Procedure time (min)—mean ± SD	92 ± 25	
LA dwell time (min)—mean ± SD	57.0 ± 18.9	
Net freezing time (s)—mean ± SD	1,567 ± 657	
Radiation dose (cGy/cm ²)—mean ± SD	1,928 ± 1,541	
Air kerma (mGy)—mean ± SD	82 ± 142	
Fluoroscopy time (min)—mean ± SD	18.0 ± 6.0	

Kühne M, et al. Front Cardiovasc Med 2021

Rhythm control with ablation



2020	Class ^a	2016	Class ^a
<i>AF catheter ablation after drug therapy failure</i>			
AF catheter ablation for PVI is recommended for rhythm control after one failed or intolerant class I or III AAD, to improve symptoms of AF recurrences in patients with:	I	Catheter or surgical ablation should be considered in patients with symptomatic persistent or long-standing persistent AF refractory to AAD therapy to improve symptoms, considering patient choice, benefit and risk, supported by an AF Heart Team.	IIa

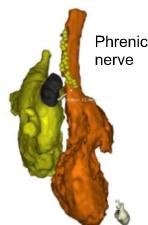
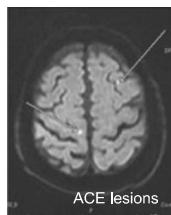
Focus on heart failure

First-line therapy	AF catheter ablation:	
AF ablation should be considered in symptomatic patients with AF and HFrEF to improve symptoms and cardiac function when tachycardia-induced cardiomyopathy is suspected.	I	
Should be considered in selected AF patients with HFrEF to improve survival and reduce HF hospitalization.	IIa	IIa

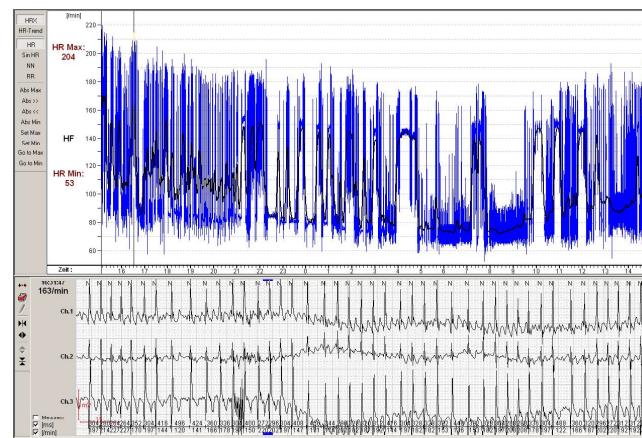
Complication rates

Table 18 Complications related to catheter ablation of atrial fibrillation

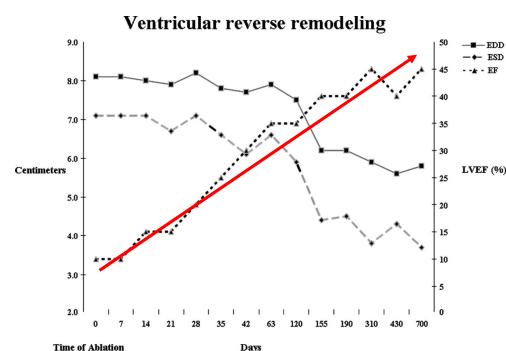
Complication severity	Complication type	Rate ^a 727,748 756,754-759
Life-threatening complications	Periprocedural death	<0.2%
	Oesophageal injury (perforation/fistula) ^b	<0.5%
	Periprocedural stroke (including TIA/air embolism)	<1%
	Cardiac tamponade	1–2%
Severe complications	Pulmonary vein stenosis	<1%
	Persistent phrenic nerve palsy	1–2%
	Vascular complications	2–4%
	Other severe complications	~1%
Other moderate or minor complications		1–2%
Unknown significance	Asymptomatic cerebral embolism (silent stroke) ^b	5–20%
	Radiation exposure	



49-y/o patient with HTN, LVEF 30%, Palpitations for 2 years, recent onset dyspnea (NYHA III)



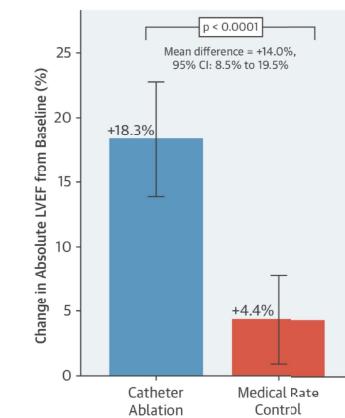
Fast heart rates lead to CHF
Tachycardiomyopathy



BUT: Not all depressed LVEFs are tachycardiomyopathy!

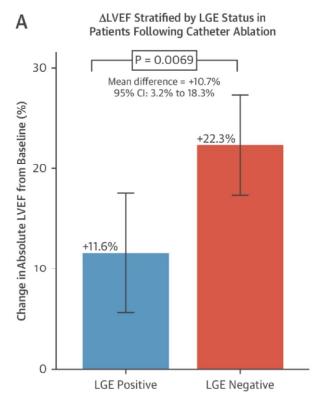
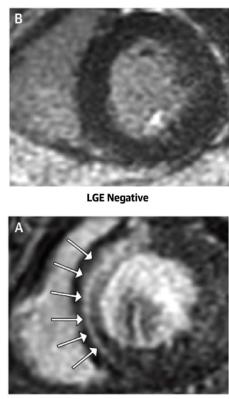
Ilkhanoff L et al., JCE 2007

- **CAMERA-MRI:**
- AF-ablation vs. Medical rate control in AF patients with impaired LVEF
- Persistent AF
- Baseline LVEF 33%

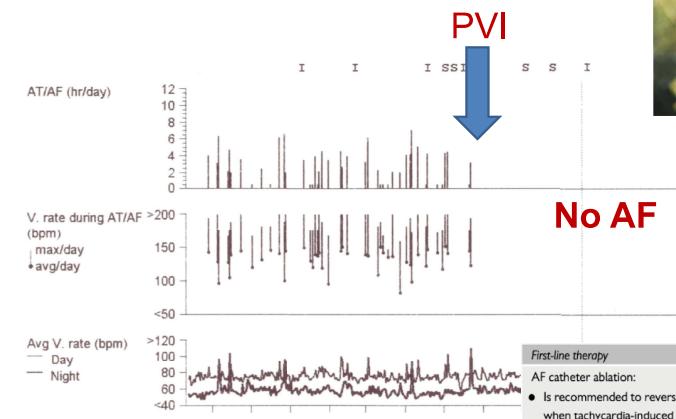


Prabhu et al., J Am Coll Cardiol 2017

Who benefits most?



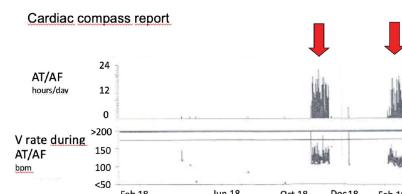
49-y/o patient with HTN, LVEF 30%, Palpitations for 2 years, recent onset dyspnea (NYHA III)



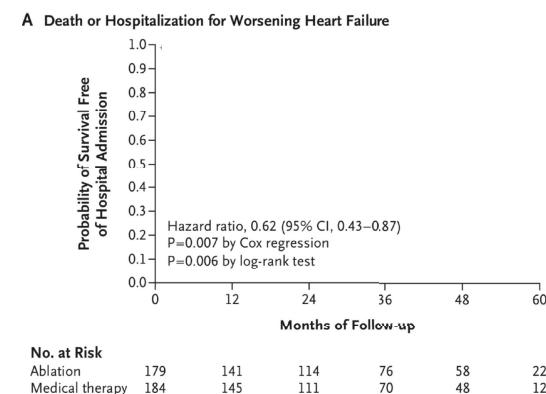
To ablate or not to ablate?
69-y/o patient, DCM, EF 25%, OMT, CRT-ICD



- CASTLE-AF:
- AF-ablation vs. medical therapy
- Age 64
- NYHA II/III
- Persistent AF 70%
- Baseline LVEF 32%
- LA 49mm
- CRT-ICD

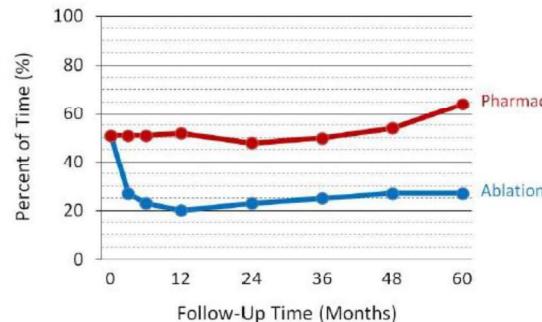


CASTLE-AF: Primary endpoint



Paradigm shift: Value of AF burden reduction

A. Mean AF Burden per Patient



First-line therapy

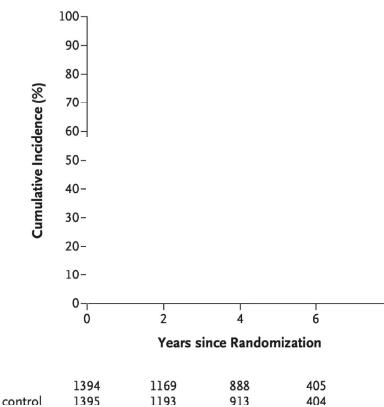
AF catheter ablation:

- Is recommended to reverse LV dysfunction in AF patients when tachycardia-induced cardiomyopathy is highly probable, independent of their symptom status.
- Should be considered in selected AF patients with HFrEF to improve survival and reduce HF hospitalization.

I
IIa

Marrouche N et al. N Engl J Med 2018

Impact on prognosis? Prognostic impact of early rhythm control vs. usual care



NEW: EAST trial

Early rhythm control
20% Reduction of prim. endpoint

- ✓ Stroke
- ✓ CV death
- ✓ Hospitalization (CHF/MI)

Kirchhof P et al. N Engl J Med 2020

Summary: Who benefits from ablation?

- Importance of patient selection
 - Predictors for success
- New technologies and improved success rates
- Procedure optimization
- Value of ablation in heart failure/tachycardiomyopathy
- Prognostic implications