HeFSSA Practitioners Program 2018
"Back to basics on heart failure treatment?"

- Co-morbidity in heart failure
- Arrhythmias in heart failure
- Special investigations in heart failure
- Heart failure with preserved EF, what is new?"

SA Heart®

Heart Failure Society of South Africa [HeFSSA]

Atrial Fibrillation (AF)

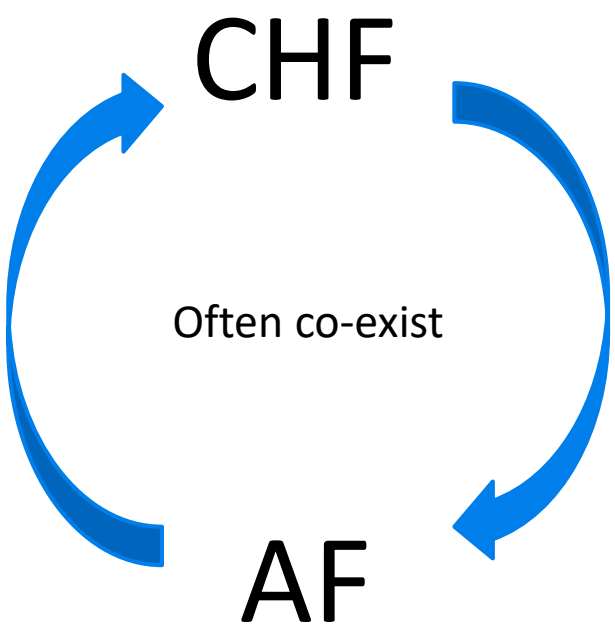
- 2-fold increase in mortality
- 3-fold increase in heart failure
- 5-fold increase in stroke/systemic embolism
- Decrease in quality of life

Kannel et al. Am J Cardiol 1998

Atrial Fibrillation and CHF

A vicious circle….

- Rapid and irregular rate -> decrease in cardiac output
- Loss of atrial kick



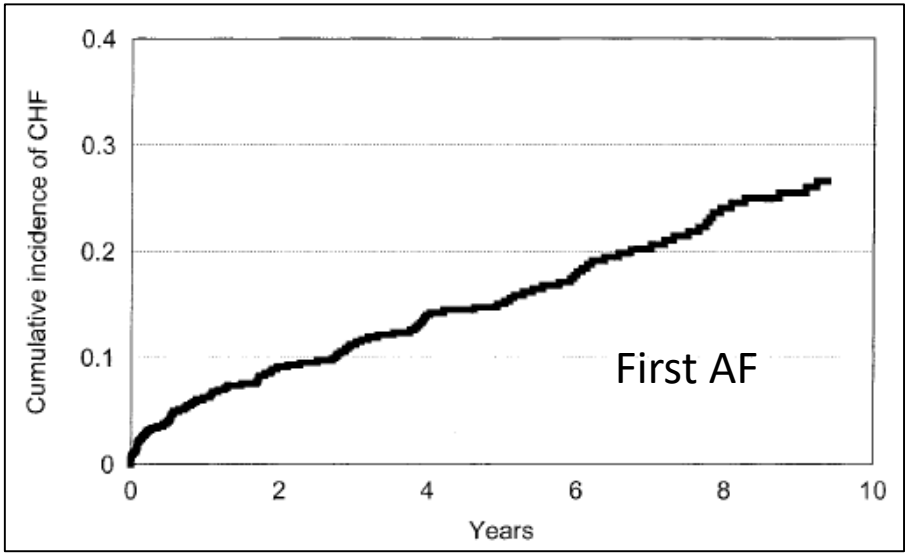
- Increases atrial filling pressures -> structural remodelling and electrophysiologic al remodelling
- Functional MR

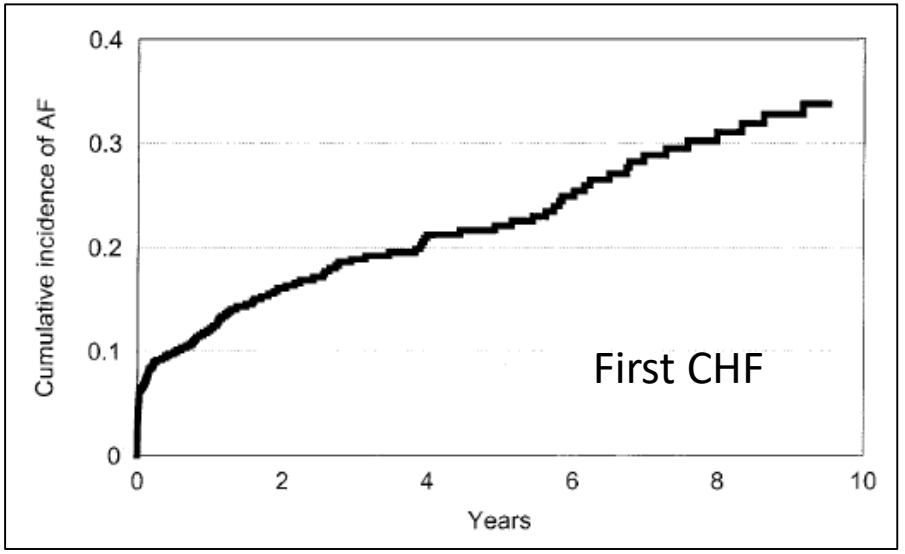
CHF is a clinical syndrome due to <u>heterogenous</u> diseases

SA Heart®

Heart Failure Society of South Africa [HeFSSA]

AF and CHF: temporal relations





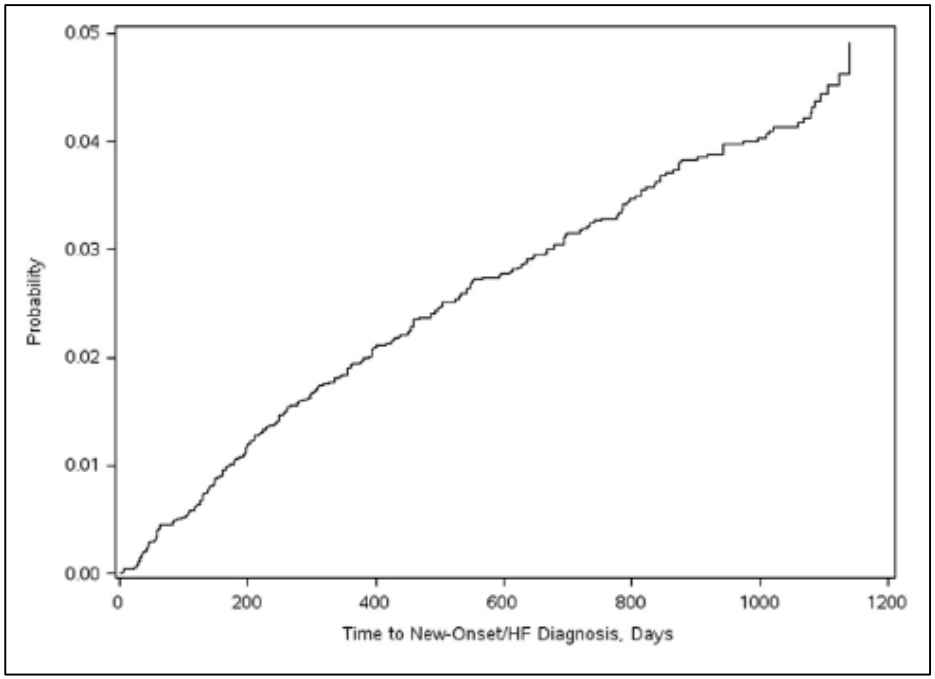
FRAMINGHAM DATA

"AF precedes CHF about as often as CHF precedes AF"

Incidence of CHF: 3-4% per year

Wang, Circulation, 2003

AF and CHF: temporal relations



ORBIT-AF DATA

6545 patients with no CHF at baseline

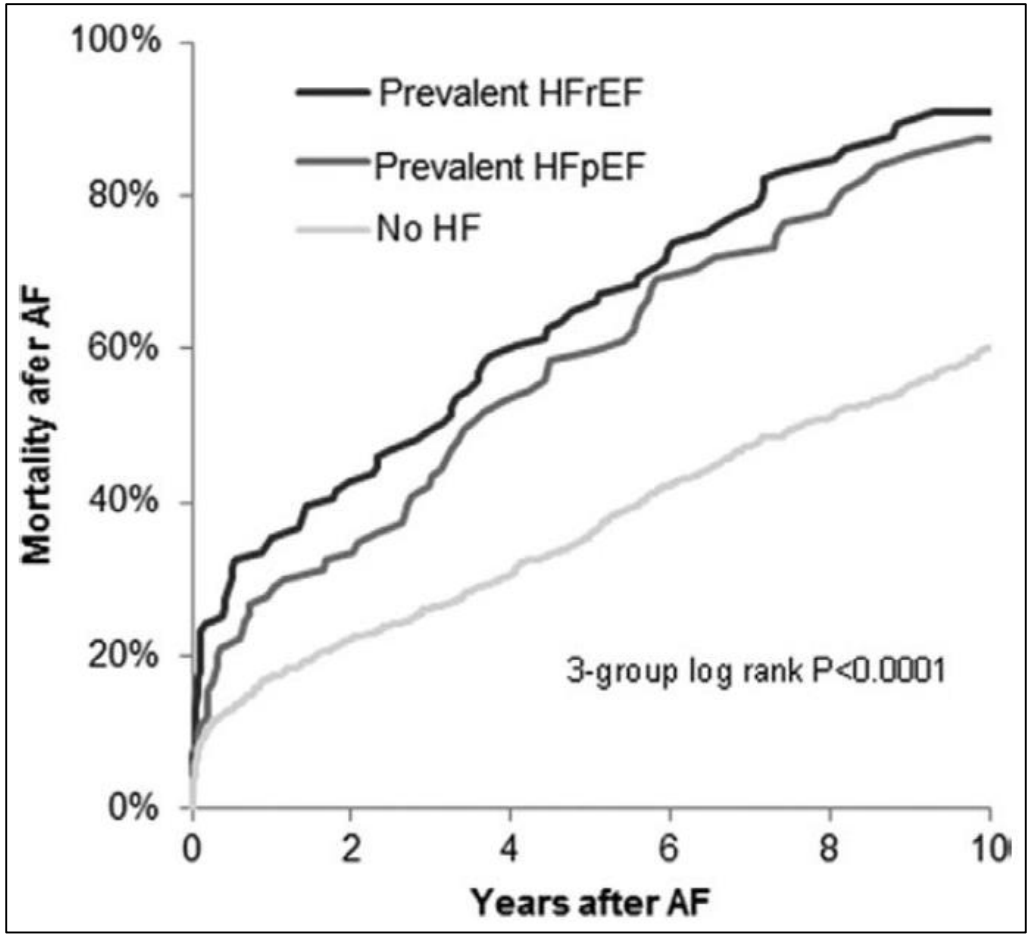
Contemporary population

Incidence of CHF: 1-2% per year

2/3 developed HFpEF

Pandey, JACC Heart failure, 2017

AF and CHF: prognosis



New onset AF is <u>associated</u> with an increase in all-cause mortality (HFrEF>HFpEF>no HF)

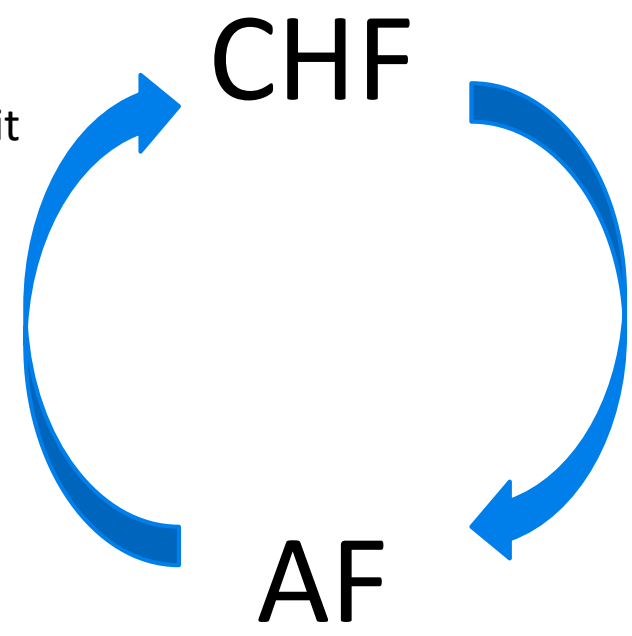
AF: marker or independent risk factor?

Verma et al., Circulation, 2017.

Atrial Fibrillation and CHF

AF causes a cardiomyopathy (AF-induced cardiomyopathy)

Treatment of AF will have benefit



AF is associated with CHF

Treatment of AF may or may not have benefit

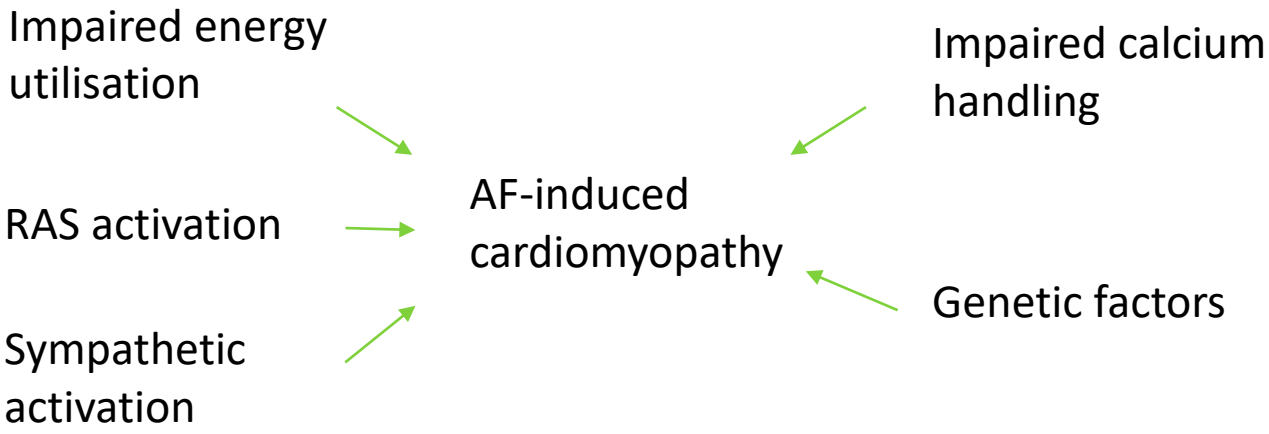
Distinguishing which is the primary disturbance is challenging

SA Heart®

Heart Failure Society of South Africa (HeFSSA)

AF-induced Cardiomyopathy

Pathogenesis:



Pervalence: (0.5%-29%)

	AF and CHF (n)	AF-induced cardiomyopathy (LV function improved)	Treatment
Redfield et al.	63	16 (25%)	AV node ablation
Ozcan et al.	56	16 (29%)	AV node ablation
Sohinki et al. (Europace 2014)	45	DCMO group (11.2%) ICMO (0.5%)	CRT and AV node ablation

Management of AF and CHF (HFrEF)

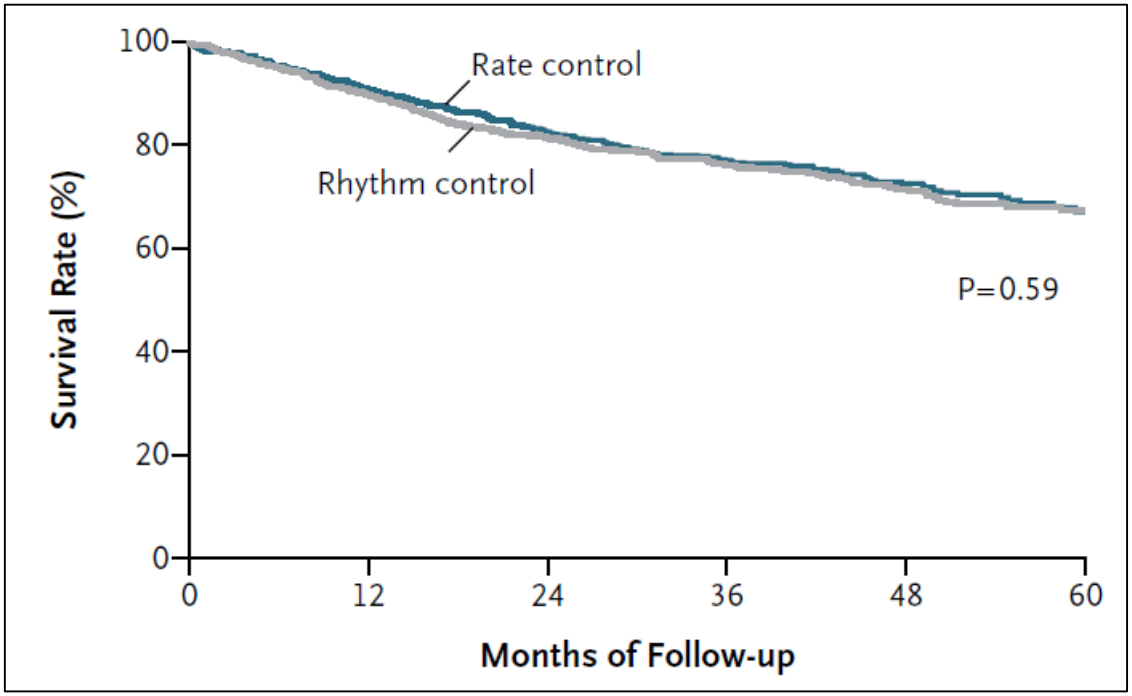
- Control risk factors (hypertension, OSA…)
- Anticoagulation usually indicated (CHA_2DS_2-VASc score)
- Standard heart failure therapy
  - ACEi/ARB/MRA
- Rate control
  - Beta-blocker +/- Digoxin
- Rhythm control (Amiodarone and/or catheter ablation)
  - Severe symptoms
  - AF-induced cardiomyopathy suspected

SA Heart®

Heart Failure Society of South Africa [HFSSA]

2016 ESC AF guideline

Antiarrhythmic drugs (AF-CHF)



RCT of rate versus rhythm control in patients with AF and CHF

1376 patients with AF and CHF (LVEF <= 35%)

- 33% paroxysmal
- 67% persistent

Rhythm control group:

- 82% Amiodarone
- 2% Sotalol
- <1% Dofetilide

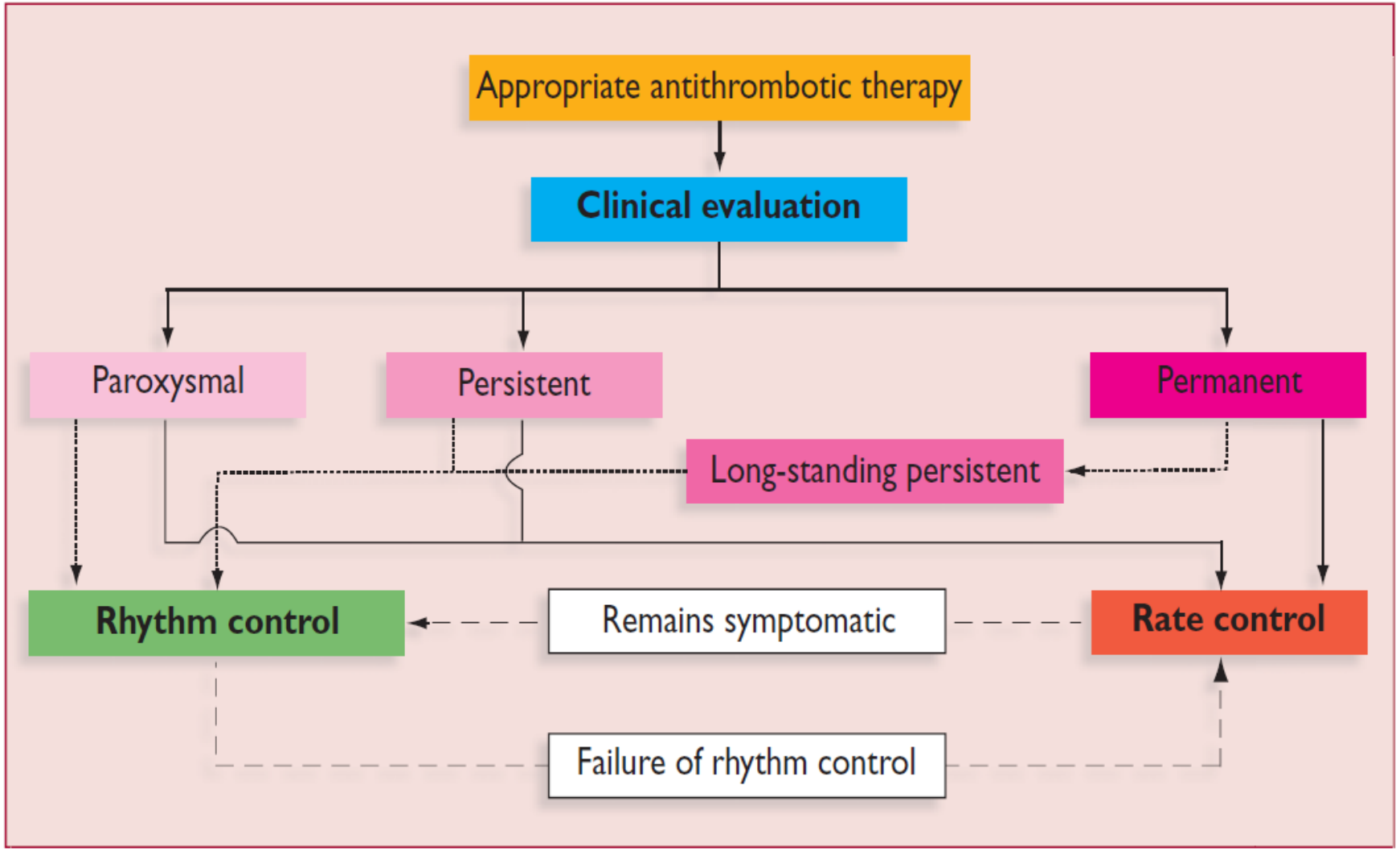
No difference in cardiovascular mortality (HR 1.06; P=0.59)

Potential benefit of sinus rhythm may be neutralized by the toxic effects of AADS

AADs only successful in maintaining SR in 65-70%

Roy et al., NEJM, 2008

Rate versus Rhythm control?



Camm et al. Europace, 2010

Management of AF and CHF

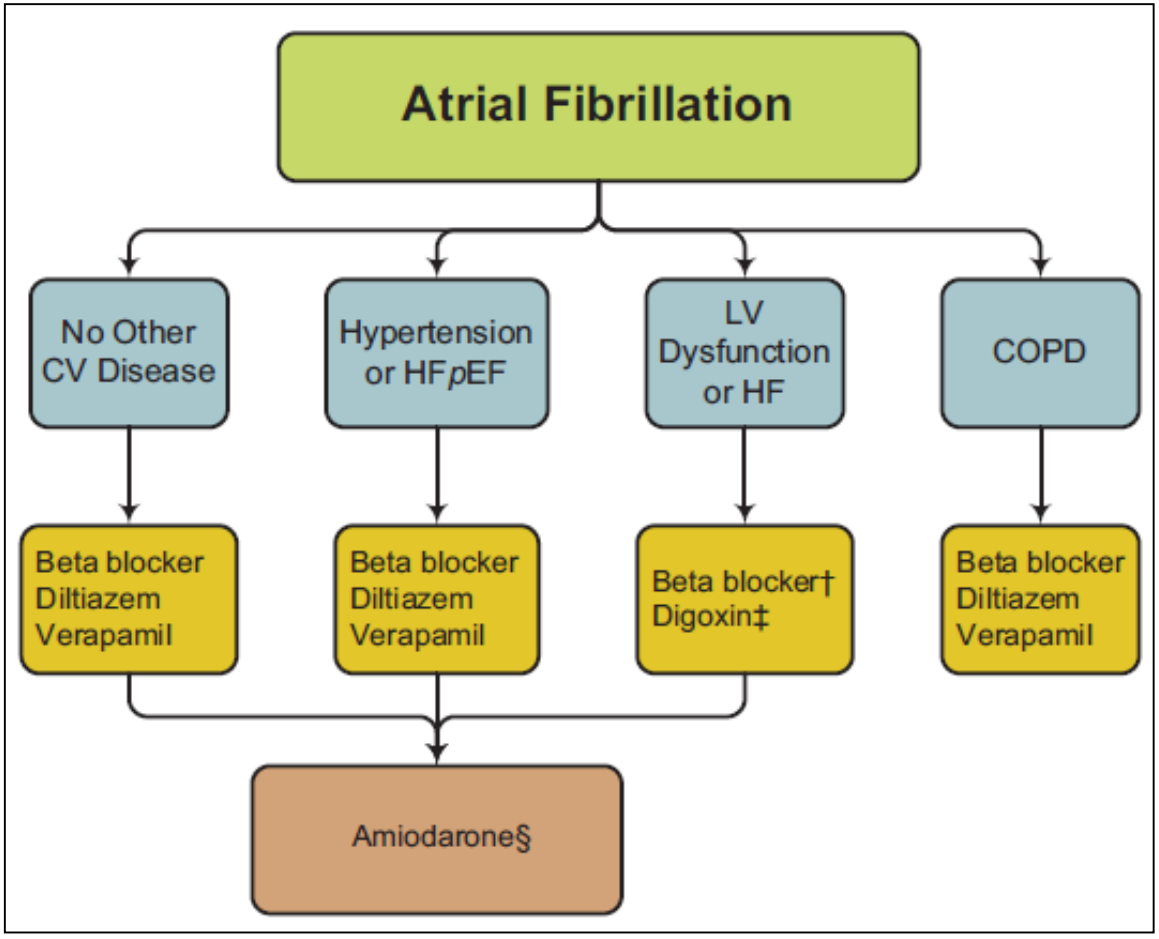
- Rate control
  - Should be the default initial strategy
  - AV nodal blockers (beta-blockers, digoxin (measure digoxin levels))
  - Avoid calcium channel blockers if LVEF<=40% because of negative inotropic effect
  - Amiodarone can be used as a second-line agent if beta-blockers, digoxin fail
  - AV node ablation and pacing is indicated in patients with permanent AF who have poor rate control despite drugs and who are considered not to be candidates for an AF ablation

SA Heart®

2016 ESC AF guideline

Heart Failure Society of South Africa [HFSSA]

Rate control strategy



Targets:

Resting HR<80bpm (IIA, B)

Resting HR<110bpm with no symptoms with normal LV function(IIB, B)

RACE II (Average resting heart rates)

Strict control : 75bpm

Lenient control group: 85bpm

2014 AHA/ACC/HRS AF guideline

Management of AF and CHF

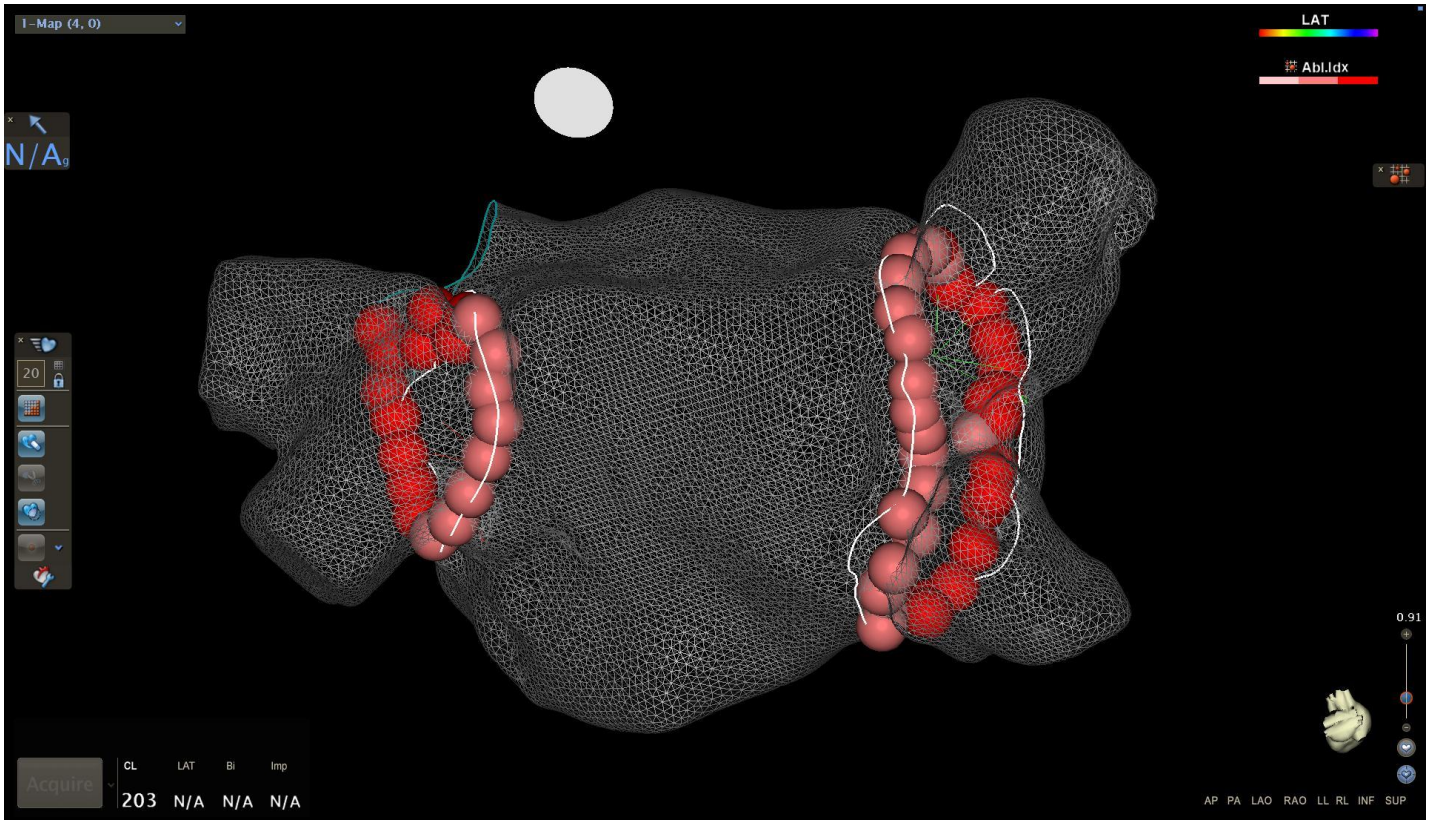
- Rhythm control
  - Persistent symptoms in AF
  - First occurrence
  - Failure to achieve adequate rate control
  - Younger patients < 65 years
  - Patients early in the natural history of AF
  - AF-induced cardiomyopathy
  - AF with a reversible disorder (e.g. Hyperthyroidism)

SA Heart®

2016 ESC AF guideline

Heart Failure Society of South Africa [HFSSA]

Role of catheter ablation in AF and CHF



ESC 2016 guidelines: No clear consensus on who should be offered catheter ablation

SA Heart®

Heart Failure Society of South Africa (HeFSSA)

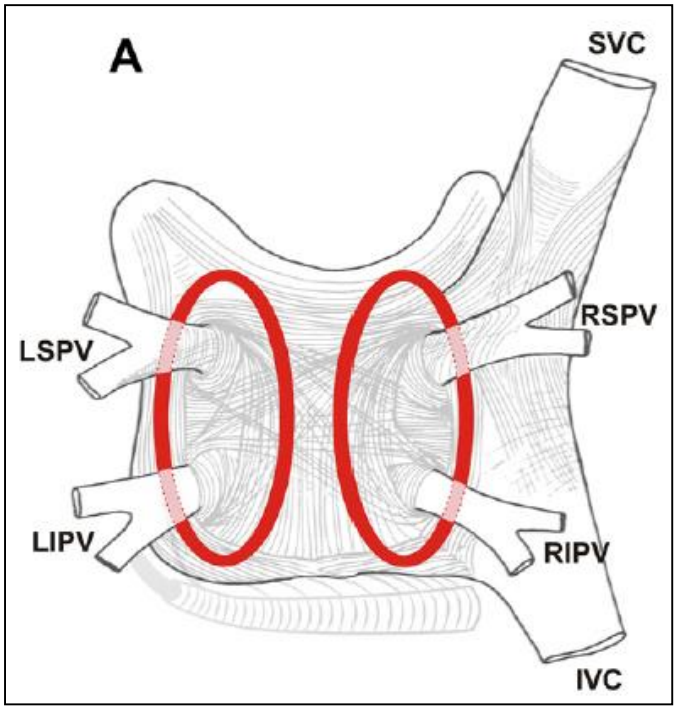
Basis for AF ablation

Aim:

1. Eliminate PV triggers

2. Alter arrhythmogenic substrate

=➔ Pulmonary vein isolation (PVI)



Paroxysmal or Persistent AF with HFrEF
Evidence from RCTs

Study	Ablation (n)	Aetiology	Control (n)	Type of AF	Ablation success	Results	Complications
PABACHF	41	73% ICMO	CRT and AVNA	49% PAF	88%	Improved LVEF (6 months)	12%
MacDonald	22	50% ICMO	Rate control	100% Persistent	50%	No difference (12 months)	20%
ARC-HF	26	33% ICMO	Rate control	100% Persistent	88%	Improved exercise tolerance (12 months)	15%
CAMTAF	67	26% ICMO	Rate control	100% Persistent	73%	Improved LVEF, better exercise tolerance (12 months)	7.7%
AATAC	102	62% ICMO	Amiodarone (beta-blockers 78%)	100% Persistent	70%	Lower mortality and unplanned hospitalisations	2.9%
CAMERA-MRI	33	100% DCMO	Rate control	28% Persistent	75%	Improved LVEF	6.1%

Proof of concept trials

Small numbers of patients (n=291)
Heterogeneous populations
Soft endpoints with 1 trial showing no benefit
Short follow-up with high ablation success rates
High complications rates in expert centres

Liang et al., Cardiac Failure Review, 2018

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 FEBRUARY 1, 2018 VOL. 378 NO. 5

Catheter Ablation for Atrial Fibrillation with Heart Failure

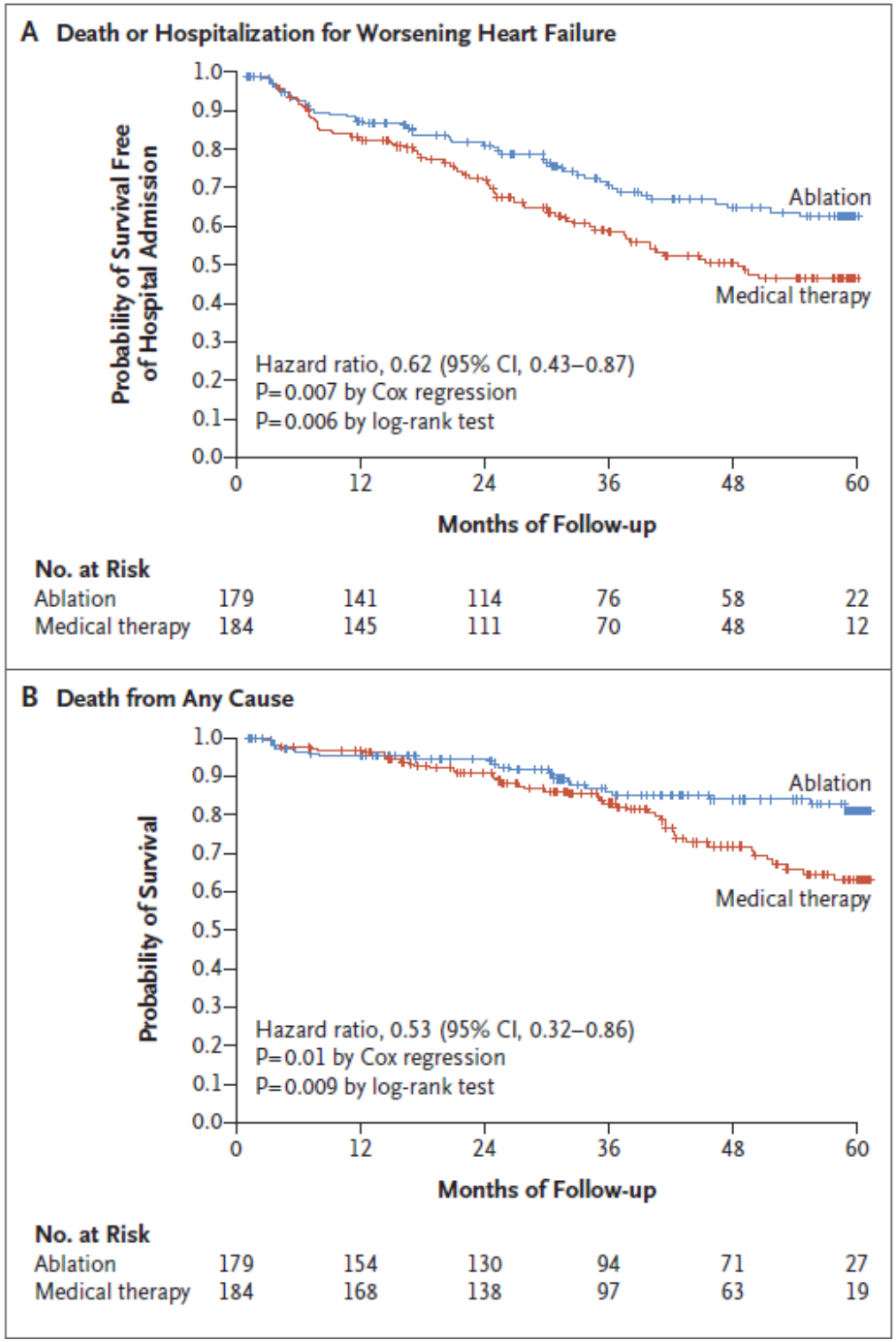
Nassir F. Marrouche, M.D., Johannes Brachmann, M.D., Dietrich Andresen, M.D., Jürgen Siebels, M.D., Lucas Boersma, M.D., Luc Jordaens, M.D., Béla Merkely, M.D., Evgeny Pokushalov, M.D., Prashanthan Sanders, M.D., Jochen Proff, B.S., Heribert Schunkert, M.D., Hildegard Christ, M.D., Jürgen Vogt, M.D., and Dietmar Bänsch, M.D., for the CASTLE-AF Investigators*

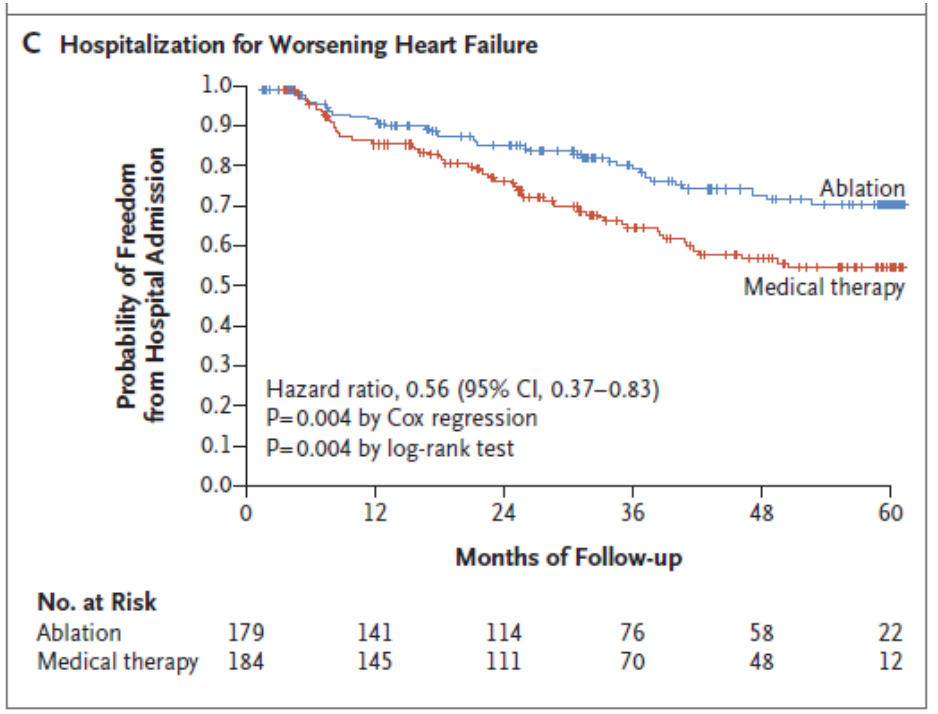
CONCLUSIONS

Catheter ablation for atrial fibrillation in patients with heart failure was associated with a significantly lower rate of a composite end point of death from any cause or hospitalization for worsening heart failure than was medical therapy.

SA Heart®

Heart Failure Society of South Africa [HFSSA]





Repeat ablations in 25%
Major complication rate 9%

63% were in SR in ablation group at follow-up
22% were in SR in the medical group

Mortality difference occurred at 3 years when ½ of patients had exited the trial

Table 2. Primary and Secondary Clinical End Points.*

End Point	Ablation (N = 179)	Medical Therapy (N = 184)	Hazard Ratio (95% CI)	P Value	
				Cox Regression	Log-Rank Test
	number (percent)				
Primary†	51 (28.5)	82 (44.6)	0.62 (0.43–0.87)	0.007	0.006
Secondary					
Death from any cause	24 (13.4)	46 (25.0)	0.53 (0.32–0.86)	0.01	0.009
Heart-failure hospitalization	37 (20.7)	66 (35.9)	0.56 (0.37–0.83)	0.004	0.004
Cardiovascular death	20 (11.2)	41 (22.3)	0.49 (0.29–0.84)	0.009	0.008
Cardiovascular hospitalization	64 (35.8)	89 (48.4)	0.72 (0.52–0.99)	0.04	0.04
Hospitalization for any cause	114 (63.7)	122 (66.3)	0.99 (0.77–1.28)	0.96	0.96
Cerebrovascular accident	5 (2.8)	11 (6.0)	0.46 (0.16–1.33)	0.15	0.14

Small number of expected endpoints (32% less than originally powered)

HR 0.62 for the primary endpoint and HR 0.53 for all-cause mortality is lower than any HF intervention to date

Large differences in effect with small number of events
e.g. CASTLE AF had only 11% of cardiovascular deaths compared to AF-CHF

Paroxysmal or Persistent AF with CHF
Evidence from RCTs - conclusions

Evolving evidence suggests an increasing role of catheter ablation in HFrEF

Small RCTs are “hypothesis generating”

CASTLE-AF has numerous limitations +++

Further trials needed

SA Heart®

Heart Failure Society of South Africa [HeFSSA]

Paroxysmal or Persistent AF with HFpEF
Evidence from RCTs

Study	Alation (n)	Aetiology	Control (n)	Type of AF	Ablation success	Results	Complications
RAFT-AF (trial underway)	300		300				

Summary of catheter ablation of AF and CHF

There is a cohort of HFrEF patients who likely will benefit from AF ablation

AF-induced cardiomyopathy
Dilated cardiomyopathy
Ischaemic cardiomyopathy

Benefit from ablation

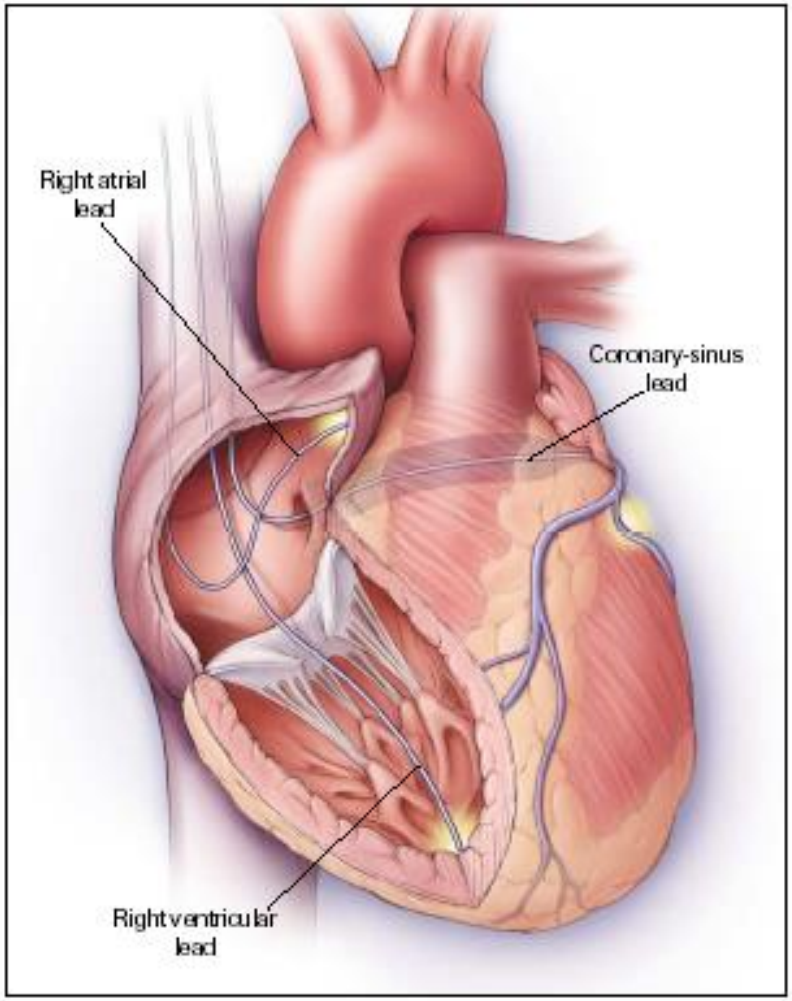
<u>For symptom relief</u>, “hard” endpoints unclear

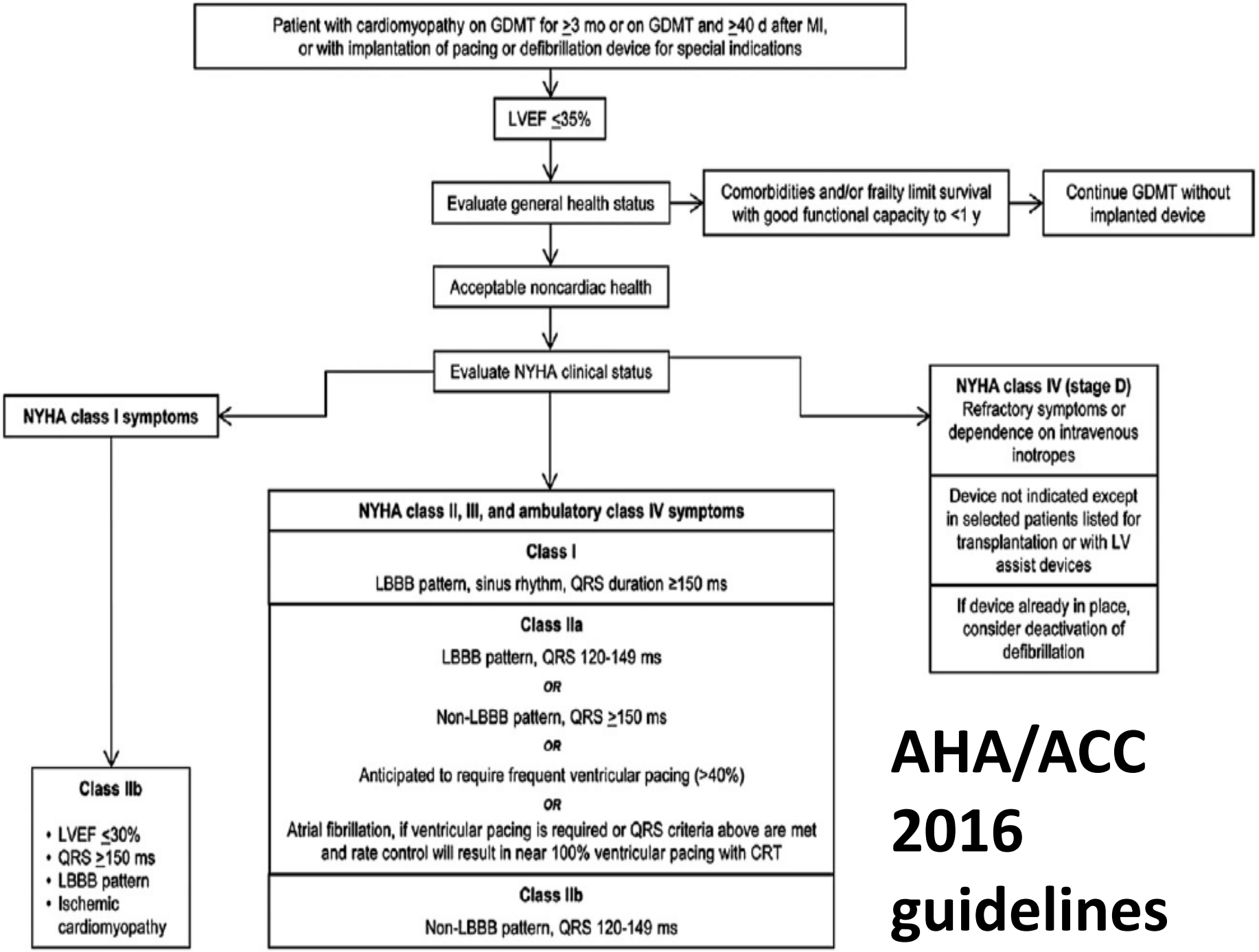
Individualised approach

SA Heart®

Heart Failure Society of South Africa [HeFSSA]

Devices for CHF – Cardiac resynchronization therapy





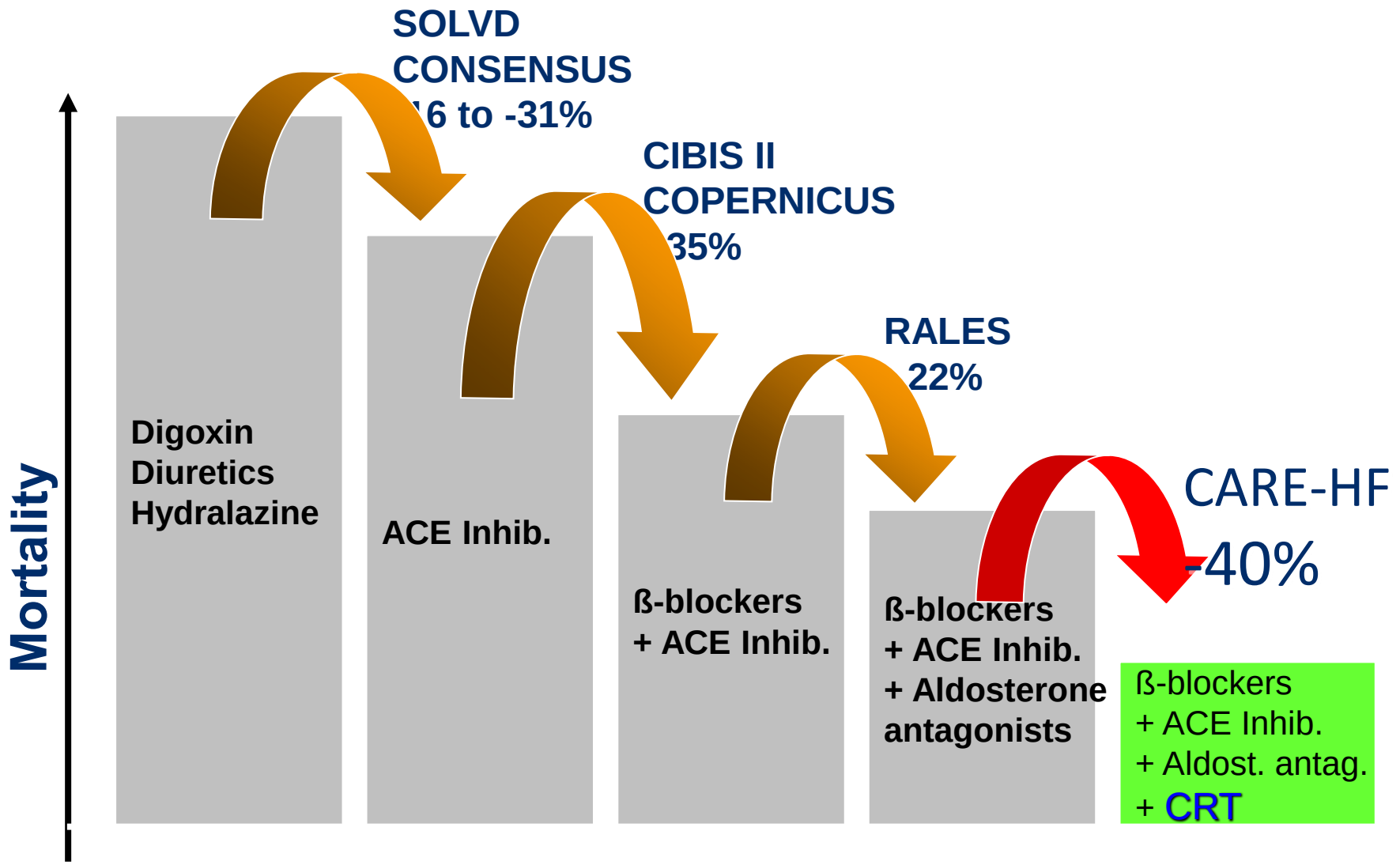
AHA/ACC 2016 guidelines

CRT: Weight of Evidence

- More than 4000 patients enrolled in randomized controlled trials
- Consistent improvement in quality of life, functional status, and exercise capacity
- Strong evidence for reverse remodeling
  - ↓ LV volumes and dimensions
  - ↑ LV ejection fraction
  - ↓ Mitral regurgitation
- Reduction in morbidity
- Reduction in mortality

SA Heart®

Heart Failure Society of South Africa [HeFSSA]



Adapted from Ellenbogen KA et al.; J Am Coll Cardiol 2005;46:2199 –203

Devices for CHF – Implantable cardioverter defibrillator (ICD)

ICD for the secondary prevention of sudden cardiac death and ventricular tachycardia

Recommendations	Class[a]	Level[b]	Ref.[c]
ICD implantation is recommended in patients with documented VF or haemodynamically not tolerated VT in the absence of reversible causes or within 48 h after myocardial infarction who are receiving chronic optimal medical therapy and have a reasonable expectation of survival with a good functional status >1 year.	I	A	151–154
ICD implantation should be considered in patients with recurrent sustained VT (not within 48 h after myocardial infarction) who are receiving chronic optimal medical therapy, have a normal LVEF and have a reasonable expectation of survival with good functional status for >1 year.	IIa	C	This panel of experts
In patients with VF/VT and an indication for ICD, amiodarone may be considered when an ICD is not available, contraindicated for concurrent medical reasons or refused by the patient.	IIb	C	155, 156

Implantable cardioverter defibrillator in patients with left ventricular dysfunction

Recommendations	Class[a]	Level[b]	Ref.[c]
ICD therapy is recommended to reduce SCD in patients with symptomatic HF (NYHA class II–III) and LVEF ≤35% after ≥3 months of optimal medical therapy who are expected to survive for at least 1 year with good functional status:			
– Ischaemic aetiology (at least 6 weeks after myocardial infarction).	I	A	63,64
– Non-ischaemic aetiology.	I	B	64,316, 317

2015 ESC guidelines