

HEART FAILURE UPDATE 2022 PLENARY 3: CHFS & HFA Joint Plenary Session -PREVENTING RECURRENT HOSPITALIZATIONS

Managing Atrial Fibrillation in Acute Heart Failure

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Conflict of Interest Disclosures

- Speaker/Advisory Board
 - Bayer,
 - Servier,
 - BMS-Pfizer,
 - Biosense Webster
- Consultant
 - Thermedical
 - Hydro-Quebec



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Objectives

- 1. Understand the prevalence and impact of AF in acute HF
- 2. Apply guideline recommendations and algorithms to the acute and chronic management of these patients





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Chicken or the egg?

- AF and HF often coexist
- Associated with many predisposing factors including:
 - HTN, DB, CAD, obesity, OSA, structural heart disease
- AF with rapid ventricular response = decompensated CMP or rhythm induced CMP?
 - Tachycardia may not be necessary to induce rhythm induced CMP
 - Multiple etiologies of CMP may coexist
- Prevalence of AF increases with severity of HF
 - 5% of pts with NYHA class I to approximatively 50% of pts with NYHA class IV



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J. Camm et al, Thoracic Key, 2018.

The chicken or the egg?

==> Determine if primary or secondary illness

- 45 y.o. male
- Consults for dyspnea
- AF 125 bpm at rest
- BP: 75/50 mmHg
- LVEF 15%, N coronaries
- MRI: no fibrosis
- LA not dilated

- 65 y.o. male
- Asymptomatic
- AF 65 bpm at rest
- BP: 95/60 mmHg
- FEVG 25%, N coronaries
- MRI: extensive fibrosis
- LA dilated



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ABCs of the acute presentation of the AF

- Buy yourself time with rate control therapy except if manifest pre-excitation
- **ECV** if hemodynamic instability (hypotension, pulmonary edema, ACS)
- ACO should be initiated as soon as possible, ideally prior to ECV, if time allows

Look for reversible factors

- Infection
- Anemia
- Dysthyroidism
- Ischemia
- Inflammation
- ...



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Approach to AF management in acute care setting



¹Hemodynamically unstable acute AF is defined as AF causing hypotension, acute coronary syndrome, or pulmonary edema.

²Initiate OAC as outlined in section 8.4.1/Figure 11.

³Initiate OAC as outlined in the CCS Algorithm.

⁴Rhythm-control is preferred in patients with newly diagnosed AF (i.e. within a year)

⁵Second line therapy – use if suboptimal control or contraindications.

⁶May be cautiously utilised in the absence of decompensated heart failure or hypotension.

⁷Use caution when administering IV amiodarone given the possibility of hypotension and/or conversion to sinus rhythm, with risk of stroke in underanticoagulated patients. ⁸TEE-guided cardioversion may be considered an alternate to 3 weeks of pre-CV OAC as outlined in section 8.4.1.3.

⁹See Supplementary Table 11 for indications and contraindications.

CCS/CHRS Comprehensive Guidelines for the Management of Atrial Fibrillation

Anticoagulation CHADS 65







¹Hemodynamically unstable acute AF is defined as AF causing hypotension, cardiac ischemia, or pulmonary edema

CCS/CHRS Comprehensive Guidelines for the Management of Atrial Fibrillation

Rhythm control



¹Consider AF symptom burden, possibility of adverse drug reactions and patient preference

²Consider alternative AADs or ablation rather than long-term amiodarone (significant risk of extra-cardiac side-effects) ³Sotalol should be used with caution in patients with high-risk features for torsade de pointes (≥ 65 years, women, reduced renal function, concomitant potassium-wasting diuretics). Sotalol is not recommended for patients with left ventricular hypertrophy. ⁴Dronedarone should be used with caution in combination with digoxin

⁵Class IC agent should be combined with AV-nodal blocking agent. Use caution for patients with left ventricular hypertrophy.

CCS/CHRS Comprehensive Guidelines for the Management of Atrial Fibrillation

Efficacy of Antiarrhythmic Drugs in AF

Patients in sinus rhythm at 1 year



Courtesy of J.Camm and L Macle

Catheter ablation AF in HF: CASTLE-AF

- Sx AF: Paroxysmal or Persistent (2/3)
- HF: NYHA II-IV, LVEF <35%, ICD
- AF ablation (n=179)
 - PVI 99%, linear ablation 52%
- Medical Treatment (n=184)
 - Rhythm-Control 30%

Results:

- Primary endpoint: 28.5% vs 44.6% (P=0.007)
 - Median f-up : 37.8 months
 - Death: 13.4% vs 25.0% (P=0.01)
 - HF hospitalisation: 20.7% vs 35.9% (P=0.004)
 - CV mortality: 11.2% vs 22.3% (P=0.009)
- Ablation group:
 - Mean 1.3+/-0.5 procedures
 - Recurrence rate: 50%
 - 27% AADs (Amio)
 - 8% increase in LVEF





Catheter ablation AF in HF: updated meta-analysis

7 RCTs (851 patients) Catheter ablation vs medical therapy 18 months mean FU

Results:

- Lower HF hospitalization rates
- Reduced all-cause mortality
- Improved LV function
- Increased 6-min walk test
- Improved peak VO₂
- No difference in adverse events

	Catheter abl	Control		Risk Ratio			Risk Ratio					
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl	Year	M-H, Random, 95% CI				
Heart failure hos	spitalization											
CASTLE-AF 2018	37	179	66	184	47.2%	0.58 [0.41, 0.81]	2018					
CAMERA-MRI 2017	0	33	2	33	0.6%	0.20 [0.01, 4.01]	2017	· · · · · · · · · · · · · · · · · · ·				
AATAC 2016	32	102	58	101	51.1%	0.55 [0.39, 0.76]	2016					
ARC-HF 2013	0	26	0	26		Not estimable	2013					
MacDonald 2010	1	20	0	18	0.6%	2.71 [0.12, 62.70]	2010					
PABA-CHF 2008 Subtotal (95% CI)	1	41 401	0	40 402	0.6% 100.0%	2.93 [0.12, 69.83] 0.57 [0.45, 0.72]	2008	•				
Total events	71		126									
Heterogeneity: Tau ² =	0.00; Chi ² = 2	.51. df =										
Test for overall effect: $Z = 4.68$ (P < 0.00001)												
			·									
All-cause morta	lity											
CASTLE-AF 2018	24	179	46	184	73.2%	0.54 [0.34, 0.84]	2018					
CAMERA-MRI 2017	0	33	0	33		Not estimable	2017					
AATAC 2016	8	102	18	101	23.8%	0.44 [0.20, 0.97]	2016					
CAMTAF 2014	0	26	1	24	1.5%	0.31 [0.01, 7.23]	2014					
ARC-HF 2013	1	26	0	26	1.5%	3.00 [0.13, 70.42]	2013					
PABA-CHF 2008	0	41	0	40		Not estimable	2008					
Subtotal (95% CI)		407		408	100.0%	0.52 [0.35, 0.76]		◆				
Total events	33		65									
Heterogeneity: Tau ² =	0.00; Chi ² = 1.	.48, df =	3 (P = 0.	69); l² =	= 0%							
Test for overall effect:	Z = 3.33 (P = 0	0.0009)										
Serious adverse	e events											
CASTLE-AF 2018	151	179	148	184	99.2%	1.05 [0.95, 1.15]	2018					
CAMERA-MRI 2017	2	33	2	33	0.2%	1.00 [0.15, 6.68]	2017	_				
CAMTAF 2014	2	26	2	24	0.3%	0.92 [0.14, 6.05]	2014					
ARC-HF 2013	1	26	0	26	0.1%	3.00 [0.13, 70.42]	2013	· · · · · · · · · · · · · · · · · · ·				
MacDonald 2010	4	20	0	18	0.1%	8.14 [0.47, 141.49]	2010					
PABA-CHF 2008	1	41	1	40	0.1%	0.98 [0.06, 15.07]	2008					
Subtotal (95% CI)		325		325	100.0%	1.05 [0.96, 1.16]		•				
Total events	161		153									
Heterogeneity: Tau ² = 0.00; Chi ² = 2.67, df = 5 (P = 0.75); l ² = 0%												
Test for overall effect: Z = 1.04 (P = 0.30)												
								0.01 0.1 1 10 100				

Favors Catheter ablation Favors Control

Kheiri et al., Inter J Cardiol 2018; 269:170-173

Catheter ablation AF in HF: updated meta-analysis

7 RCTs (851 patients) Catheter ablation vs medical Rx 18 months mean FU

Results:

- Lower HF hospitalization rates
- Reduced all-cause mortality
- Improved LV function
- Increased 6-min walk test
- Improved peak VO₂
- No difference in adverse events

	Cath	eter ablat	tion	(Control			Mean Difference		Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	Year	IV, Random, 95% Cl
A Absolute chang	ge in left	ventricul	ar eject	tion frac	tion					
CASTLE-AF 2018	8.7	13.57	51	-1	18.86	37	11.7%	9.70 [2.57, 16.83]	2018	
CAMERA-MRI 2017	18.3	11.4	33	4.3	11.4	33	13.7%	14.00 [8.50, 19.50]	2017	+
AATAC 2016	8.1	4	94	6.2	5	83	18.0%	1.90 [0.55, 3.25]	2016	
CAMTAF 2014	8.1	12.36	26	-3.6	9.48	24	12.9%	11.70 [5.62, 17.78]	2014	+
ARC-HF 2013	10.9	11.5	26	5.4	8.5	26	13.7%	5.50 [0.00, 11.00]	2013	-
MacDonald 2010	4.5	11.1	19	2.8	6.7	18	13.2%	1.70 [-4.17, 7.57]	2010	+
PABA-CHF 2008	8	8	41	-1	4	40	16.9%	9 00 (6 26 11 74)	2008	•
Subtotal (95% CI)			290			261	100.0%	7.40 [3.37, 11.43]		•
Heterogeneity: Tau ² =	= 23.04; (Chi ² = 44.	21. df =	6 (P < 0	.00001);	r= 869	6			
Test for overall effect	Z = 3.60	(P = 0.00)	003)							
B 6-minute walk	distance									
CASTLE-AF 2018	-6.9	188.8	50	-38.5	185.17	35	5.6%	31.60 [-49.03, 112.23]	2018	
CAMERA-MRI 2017	55	113.99	33	28	113.99	33	10.5%	27.00 [-28.00, 82.00]	2017	
AATAC 2016	22	41	94	10	37	83	37.3%	12.00 [0.51, 23.49]	2016	- - -
ARC-HF 2013	19.67	109.8	26	-22.67	69.02	26	12.1%	42.34 [-7.51, 92.19]	2013	
MacDonald 2010	20.1	76.5	17	21.4	77.4	15	11.0%	-1.30 [-54.75, 52.15]	2010	
PABA-CHF 2008	71	72.92	41	16	56.85	40	23.4%	55.00 (20.50, 03.44)	2008	
Subtotal (95% CI)			261			232	100.0%	26.96 [6.39, 47.54]		-
Heterogeneity: Tau ² =	= 260.85;	Chi ² = 9.	15, df =	5 (P = 0	$(10); ^2 = 4$	45%				
Test for overall effect	: Z = 2.57	(P = 0.01	D)							
C Peak oxygen c	onsumpt	tion (VO ₂)							
CAMTAF 2014	1.4	7.05	26	-2	7.1	24	29.1%	3.40 [-0.53, 7.33]	2014	±
ARC-HF 2013	2.13	5.52	24	-0.94	3.13	26	70.9%	3.07 (0.56, 5.58)	2013	
Subtotal (95% CI)			50			50	100.0%	3.17 [1.05, 5.28]		•
Heterogeneity: Tau ² =	= 0.00; C	hi² = 0.02	df = 1 ((P = 0.89); I ² = 0%)				
Test for overall effect	: Z = 2.9	(P = 0.00)	03)							
										100 .50 0 50 10
										-100 -50 0 50 10

Kheiri et al., Inter J Cardiol 2018; 269:170-173

Catheter ablation AF in HF: CABANA



The Catheter Ablation Versus Antiarrhythmic Drug Therapy in Atrial Fibrillation (CABANA) Trial

Trial Design:

- 2204 AF patients from 115 centers
 - North America, Asia
 - Europe, and Australia
- Follow-up \geq 2 years

Primary Endpoint:

 Composite endpoint of all-cause mortality, disabling stroke, serious bleeding, or cardiac arrest

Major Secondary Endpoints:

- All-cause mortality
- Death (all-cause) or CV hospitalization



Packer et al. JAMA 2019 ;321(13):1261-1274

Catheter ablation AF in HF: CABANA

INTENTION-TO-TREAT ANALYSES

Composite endpoint of all-cause mortality, disabling stroke, serious bleeding, or cardiac arrest



All-Cause Mortality



100-Hazard ratio, 0.83 (95% CI, 0.74-0.93); Log-rank P = .001 80 Event Rate, % 60 Drug therapy Catheter ablation 40 20-0. 0 12 18 24 30 36 42 54 6 48 60

Death or Cardiovascular

Hospitalization

Time Since Randomization, mo

Douglas L. Packer. Circulation. Ablation Versus Drug Therapy for Atrial Fibrillation in Heart Failure, Volume: 143, Issue: 14, Pages: 1377-1390, DOI: (10.1161/CIRCULATIONAHA.120.050991)

Catheter ablation AF in HF: RAFT-AF



- 411 AF + HF patients
- Follow-up median 37.4 mois
- Interventions:
 - Rhythm-control arm (N=214):
 - Catheter ablation ± AAD
 - Rate-control arm (N=197):
 - Rest HR<80; 6MW HR <110
- Outcomes:
 - Primary Outcome Measures:
 - Time to all-cause mortality or HF
 event



% of patients in AF/Flutter

ABLATION RATE CONTROL

Catheter ablation AF in HF: RAFT-AF







Parkash R, Circulation 2022 Mar 22. doi: 10.1161/CIRCULATIONAHA.121.057095.

Dr A. Tang; ACC 2021

Catheter ablation AF in HF: RAFT-AF

- In pts with high burden AF and HF, there was no statistical difference in allcause mortality or HF events with ablation-based rhythm-control versus ratecontrol.
- However, there was a non-significant trend for improved outcomes (QOL, LVEF, NT-proBNP) with ablation-based rhythm control over rate-control.
- Probable benefit on mortality and HF events for ablation over rate control for pts with LVEF < 45%



Parkash R, Circulation 2022 Mar 22. doi: 10.1161/CIRCULATIONAHA.121.057095.





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Training/Practice Contemporary Issues in Cardiology Practice

Atrial Fibrillation in Heart Failure: A Practical Approach for the Clinician

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Conclusion and key takeaways

AF and HF go hand in hand

Multiple therapeutic approaches

LVEF monitoring is key but not only marker

Device depending on recovery

Always think of anticoagulation

There is a definite place for catheter ablation, but not yet for all!



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