Innere Medizin III
Abteilung für Kardiologie und Angiologie
Universitätsklinikum Tübingen

Bedeutung der Rhythmisierung im Rahmen der Herzinsuffizienztherapie

PD Dr. med. David Heinzmann
Leiter Elektrophysiologie und EPU-Labor

12.03.2026

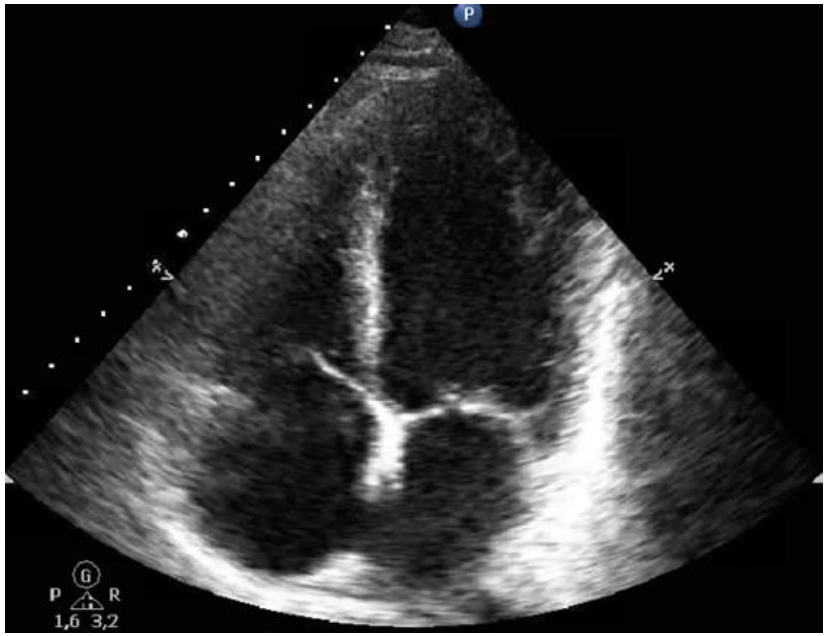
Universitätsklinikum Tübingen

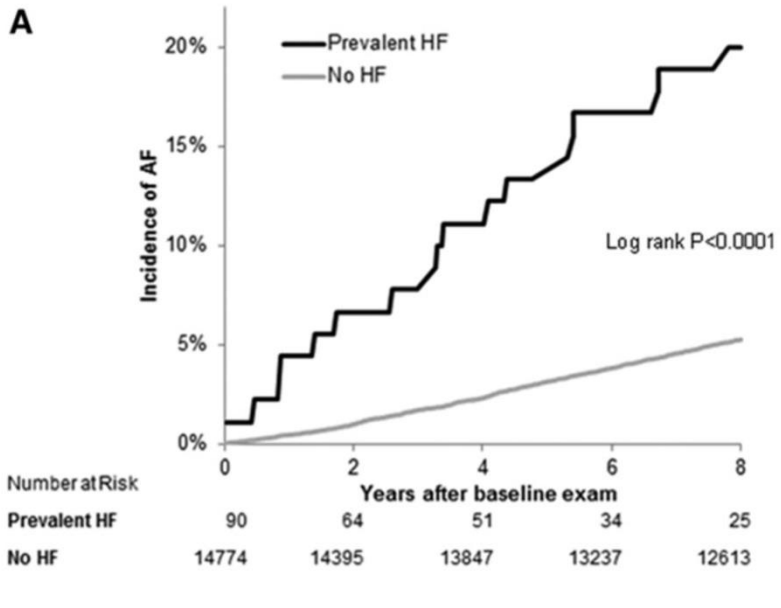
Interessenkonflikt

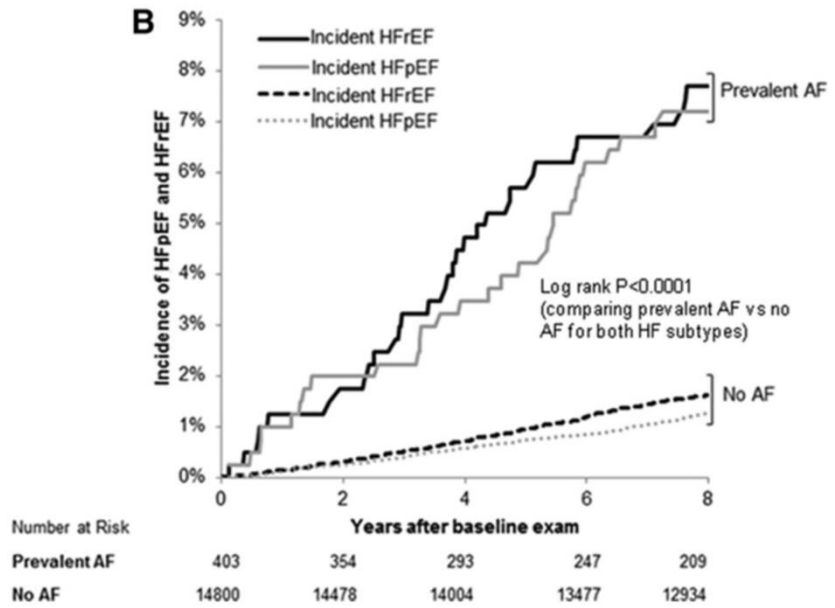
Speaker fees: AstraZeneca, Pfizer

Travel expenses: Abbott, Medtronic, Johnson&Johnson

Fokus – VHF & Herzinsuffizienz

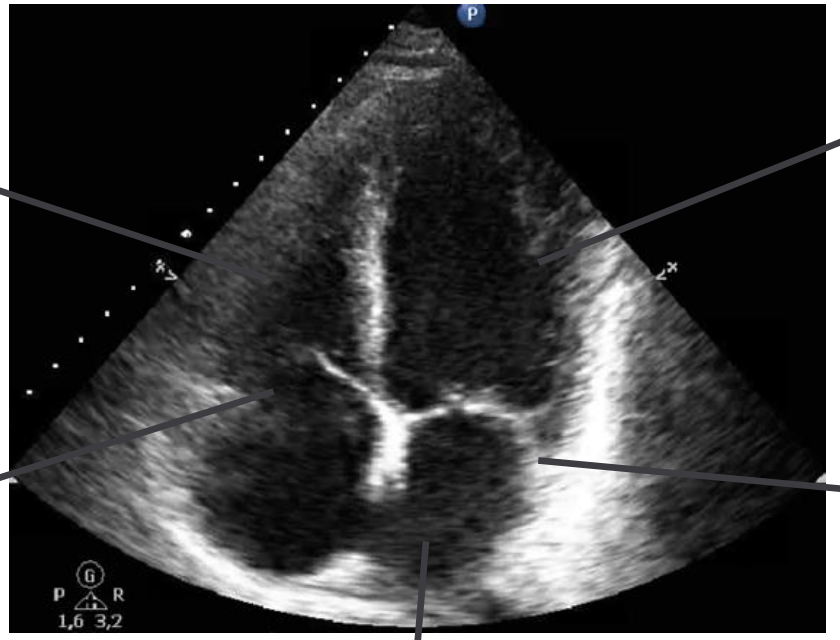






Santhanakrishnan et al. Circulation 2016

Vorhofflimmern hat Konsequenzen



Neurohumorale Aktivierung

Remodeling - Dilatation

atrial kick

Fibrosierung
Dilatation
Inflammation

Thrombembolie

Auslösende Faktoren berücksichtigen

- Hyperthyreose
- Infektionen
- Elektrolytstörungen
- Arterielle Hypertonie
- OSAS
- Mitralvitien

Prädisponierende Faktoren kontrollieren

Prädisponierende Faktoren kontrollieren – RACE 3

prospektiv, multizentrisch, randomisiert, open-label, blinded endpoint

persistierendes Vorhofflimmern (< 5 Jahre)

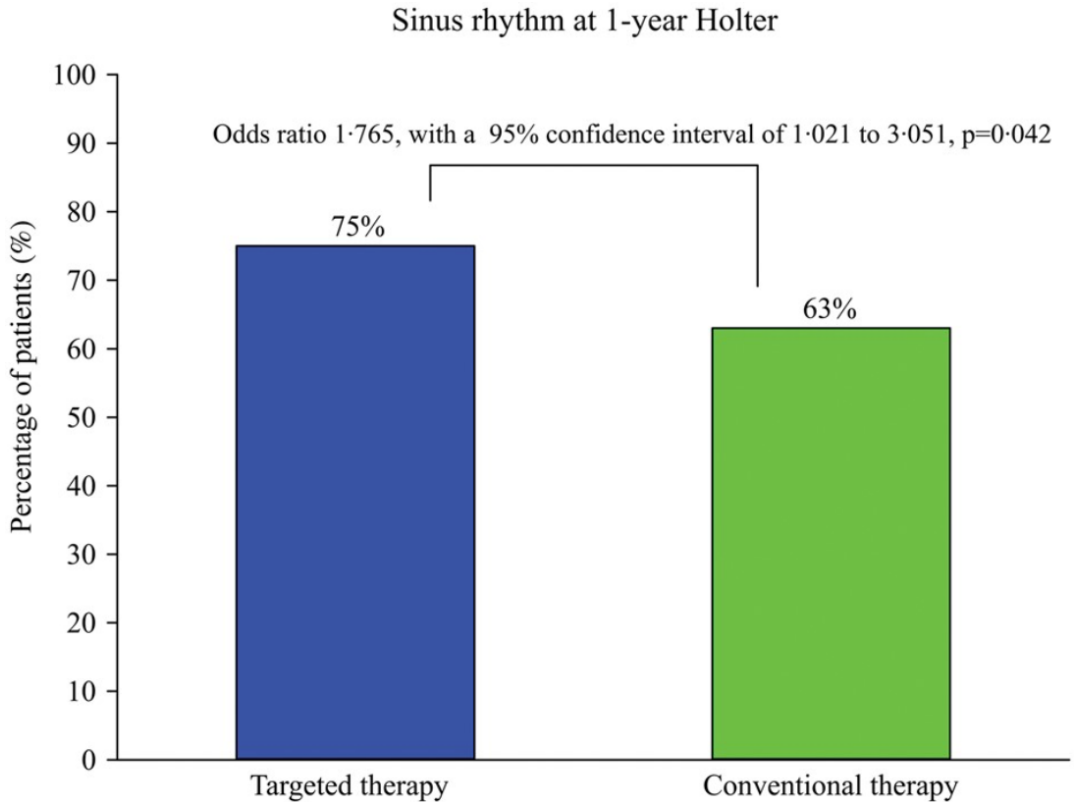
HFpEF and HFrEF

Rhythmuskontrolle

Targeted:

- Betablocker
- ACE/ARB
- MRA
- Statin

+ kardiologische Rehabilitation
+ HF nurse alle 6 Wochen
+ 3x30min Bewegung/Woche



Sinus rhythm during 7d holter.

Rienstra, Eur Heart J, 2018

Rhythmus kontrollieren?

EAST-AFNET4 - früh richtungsweisend

prospektiv, multizentrisch, randomisiert, open, blinded outcome (n=2789)

< 1 Jahr VHF

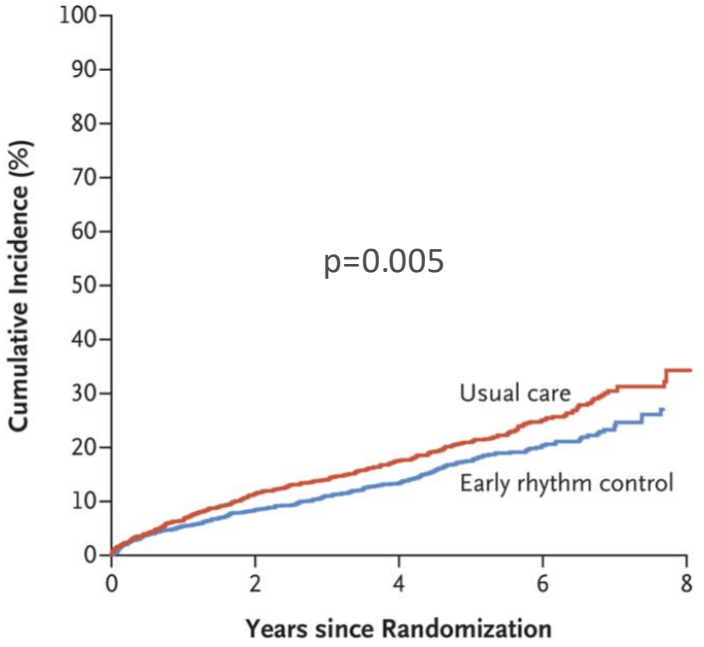
Erhöhtes Risiko f. Schlaganfall

Intervention: Frühe Rhythmuskontrolle vs. usual care

Endpunkt: kardiovask. Tod, Schlaganfall, Hospitalisierung wg. Herzinsuffizienz, akutes Koronarsyndrom

Kirchhof et al., N Engl J Med. 2020

EAST-AFNET4 - früh richtungsweisend



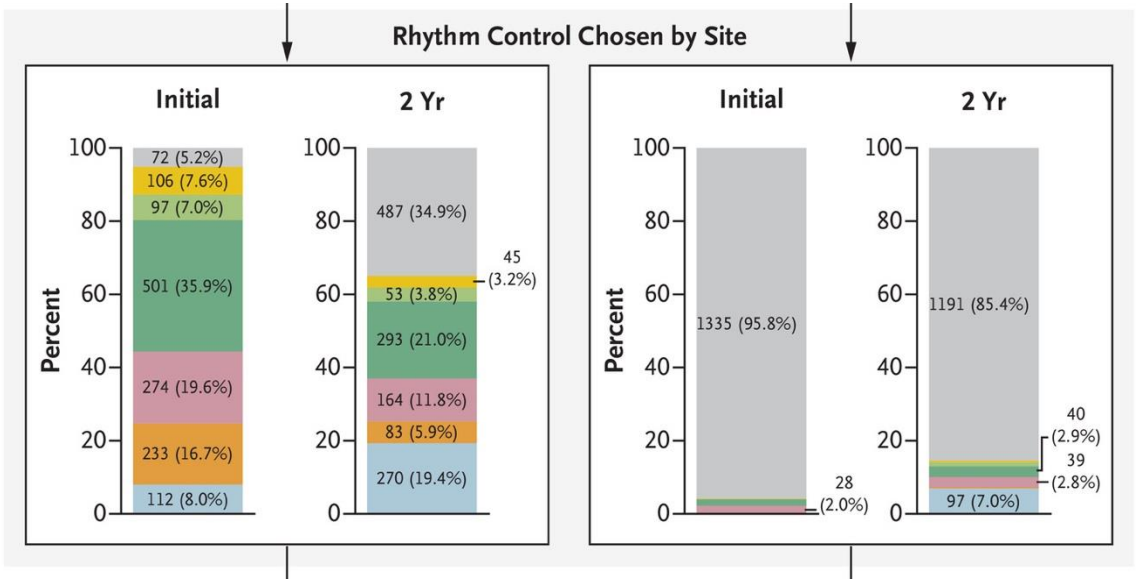
No. at Risk

Usual care	1394	1169	888	405	34
Early rhythm control	1395	1193	913	404	26

composite of death from cardiovascular causes, stroke, or hospitalization with worsening of heart failure or acute coronary syndrome

Early rhythm control

Usual care

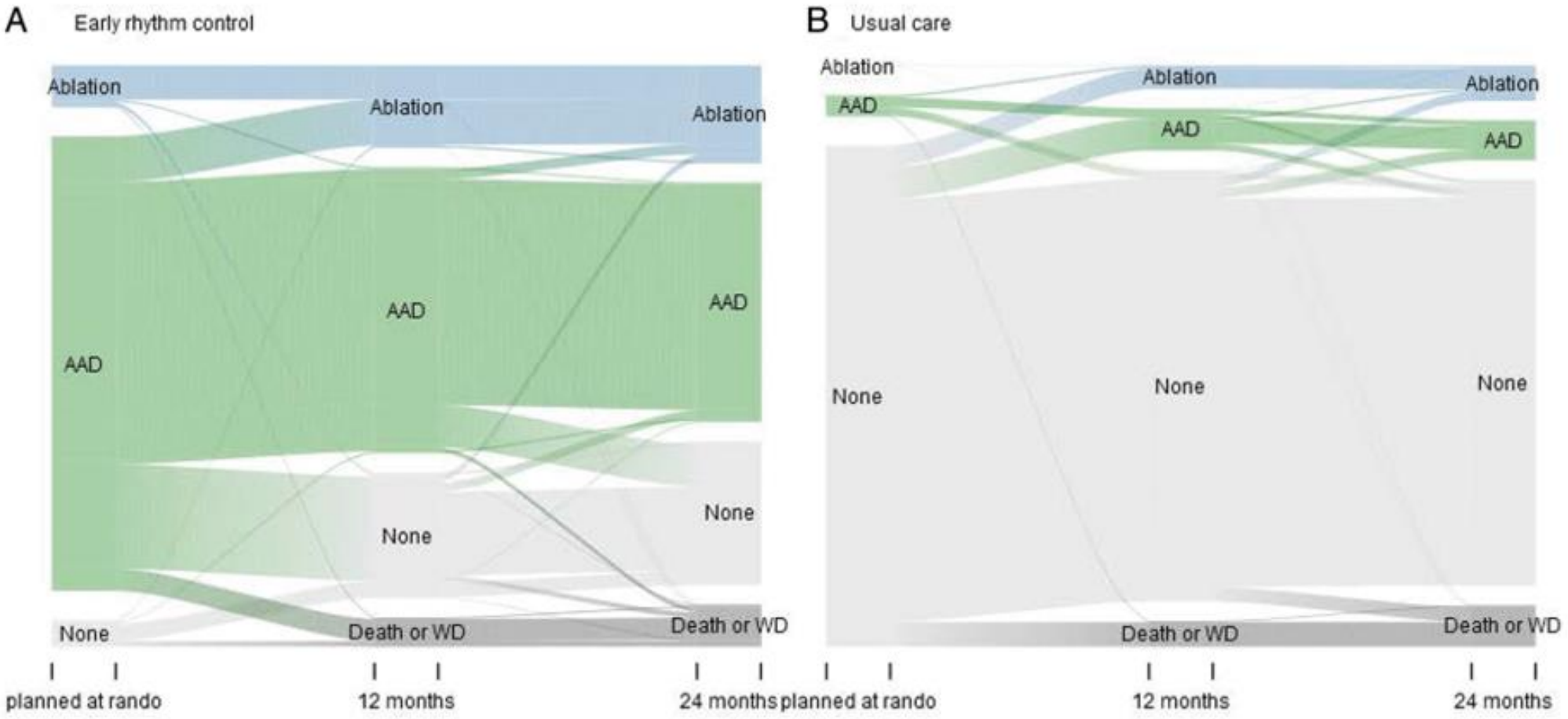


82% SR

60,5% SR

Kirchhof et al., N Engl J Med. 2020

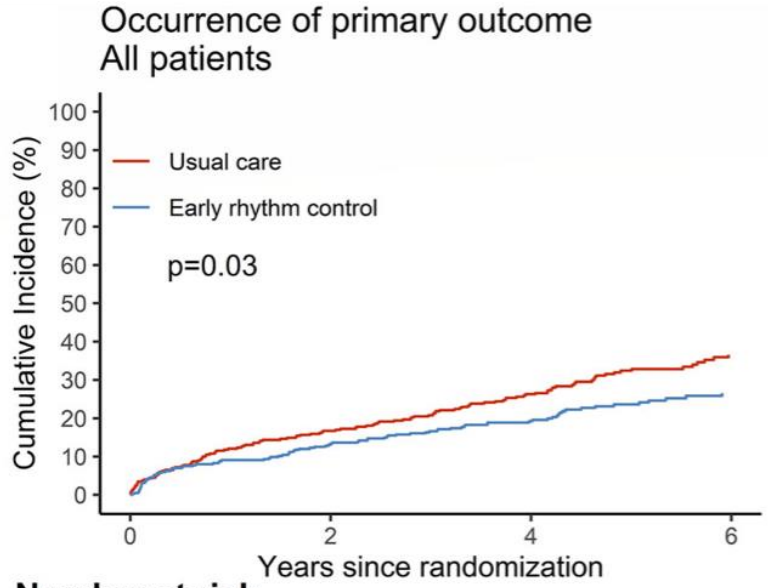
EAST-AFNET4 - früh richtungsweisend



Metzner et al., Europace, 2022

EAST-AFNET4 - Herzinsuffizienz

Subanalyse Herzinsuffizienzpatienten



Number at risk

Usual care	402	315	223	91
Early rhythmcontrol	396	316	226	92

composite of death from cardiovascular causes, stroke, or hospitalization with worsening of heart failure or acute coronary syndrome

Rilling et al., Circulation 2021

Tachyarrhythmie & HF

Table 3. Major randomised controlled trials comparing treatment strategies for AF patients with HFrEF.

Studies	Year	N	Compared therapy	Follow-up	Primary outcome	Freedom from AF	Δ LVEF from baseline	p-value (Δ LVEF)
Medical Rhythm vs Medical Rate control								
AF-CHF[40, 65] **Roy et al.**	2008	1376	Rhythm vs Rate control	37 months	Cardiovascular mortality	73% vs ≈35%	8.0% vs 4.5%	p=0.19
CAFÉ-II[66] **Shelton et al.**	2009	61	Rhythm vs Rate control	12 months	QoL	66% vs 0%	Qualitative increase vs no increase in LVEF	p=0.014
Invasive Rhythm vs Invasive Rate control								
PABA-CHF[72] **Khan et al.**	2008	81	RF catheter ablation vs AVN ablation + CRT	6 months	LVEF, 6MWT and QoL	88% vs 0%	8.0% vs -1.0%	p<0.001
Invasive Rhythm vs Medical treatment								
MacDonald et al.[76]	2010	41	RF catheter ablation vs Rate control	6 months	Change in LVEF	50% vs 0%	4.5% vs 2.8% (MRI) 8.2% vs 1.4% (RNVG)	p=0.6 p=0.032
ARC-HF[74] **Jones et al.**	2013	52	RF catheter ablation vs Rate control	12 months	Peak VO_2	88% vs 4%	10.9% vs 5.4%	p=0.055
CAMTAF[75] **Hunter et al.**	2014	50	RF catheter ablation vs Rate control	6 months	Difference in LVEF	81% vs 0%	8.1% vs -3.6%	p<0.001
AATAC[77] **Di Biase et al.**	2016	203	RF catheter ablation vs Amiodarone	24 months	Freedom from AF	70% vs 34%	8.1% vs 6.2%	p=0.02
CAMERA-MRI[78] **Prabhu et al.**	2017	68	RF catheter ablation vs Rate control	6 months	Change in LVEF	75% vs 0% (at 1 month)	18.3% vs 4.4%	p<0.0001
CASTLE-AF[79] **Marrouche et al.**	2018	363	RF catheter ablation vs Medical therapy	38 months	Mortality and Hospitalization for HF	63.1% vs 21.7%	8.0% vs 0.2%	p=0.005

Raymond-Paquin et al., Can J Cardiol. 2018

CASTLE-AF – landmark für HFrEF

prospektiv, multizentrisch, randomisiert, open-label, 363 Patienten

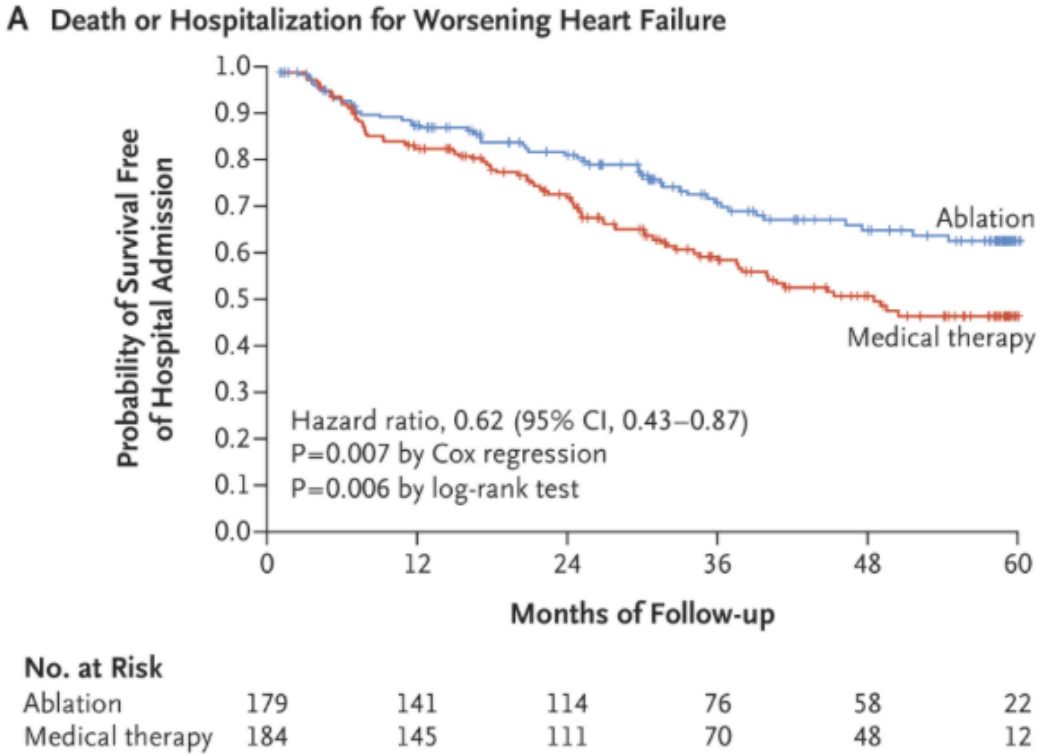
Paroxysmales/persistierendes VHF

Herzinsuffizienz NYHA ≥ II + LVEF ≤35%

Antiarrhythmika frustran

Katheterablation vs. Medikamentöse Therapie (Rate or Rhythm)

Endpunkt: Tod, Hospitalisierung wg. Herzinsuffizienz



Marrouche et al., N Engl J Med. 2018

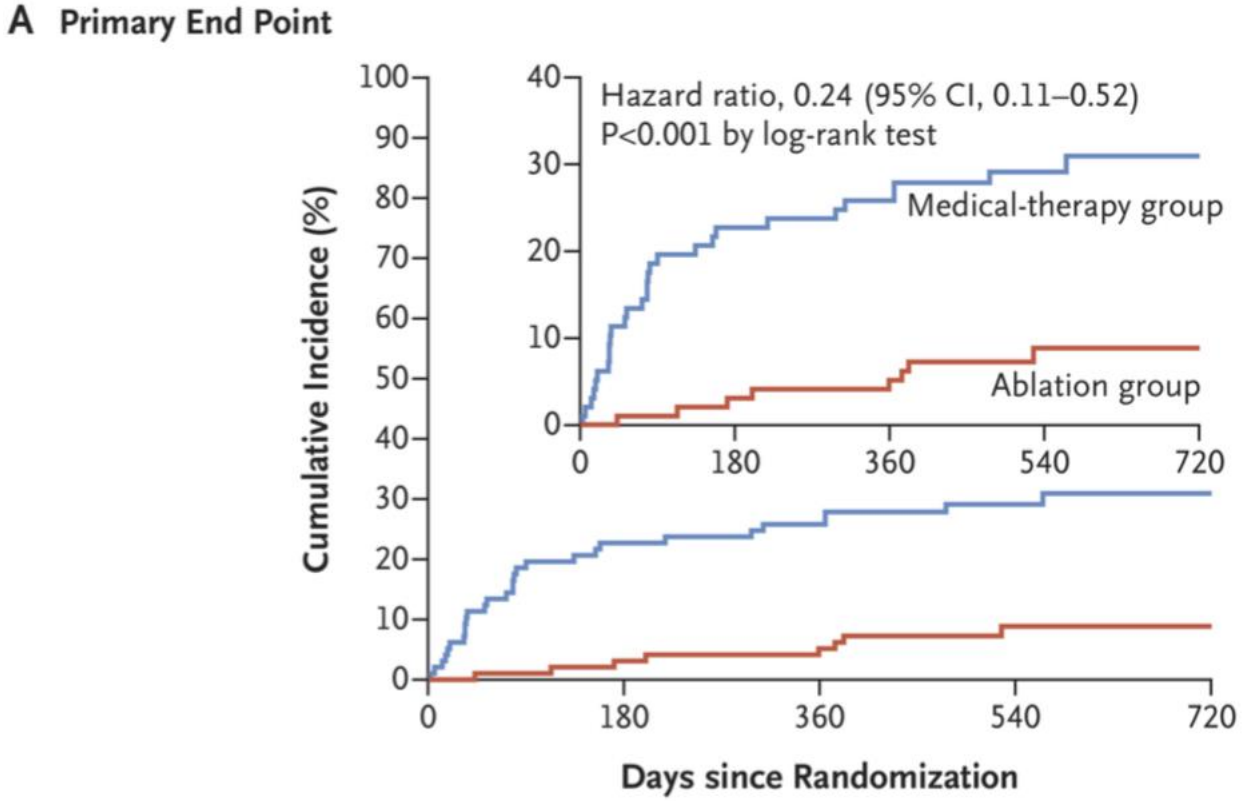
CASTLE-AF – landmark für HFrEF

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

Marrouche et al., N Engl J Med. 2018

CASTLE-HTx



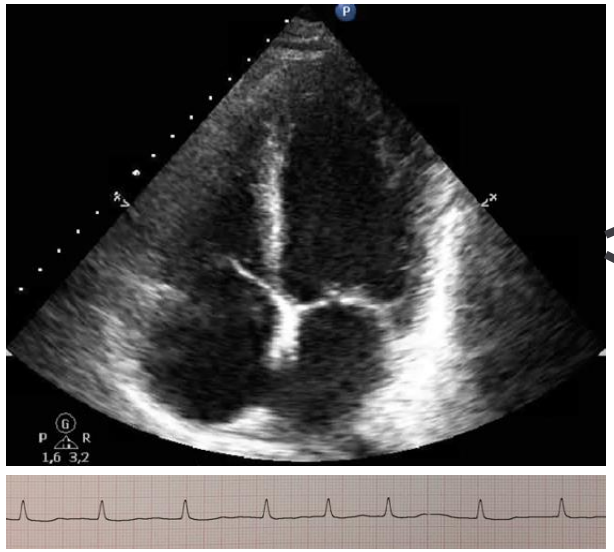
composite of death from any cause, implantation of a left ventricular assist device, or urgent heart transplantation

Sohns et al. N Engl J Med 2023; 389:1380-1389

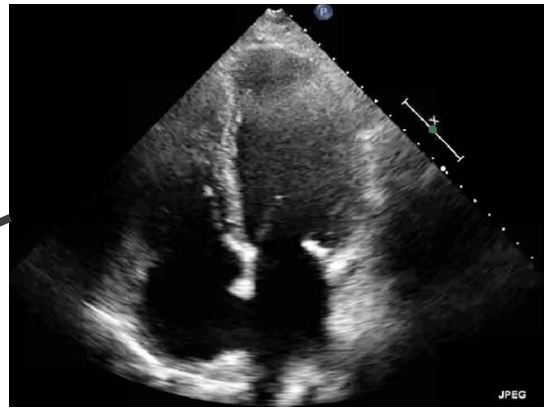
Vorhofflimmern HFrEF – wer profitiert am meisten?

Vorhofflimmern HFrEF – wer profitiert am meisten?

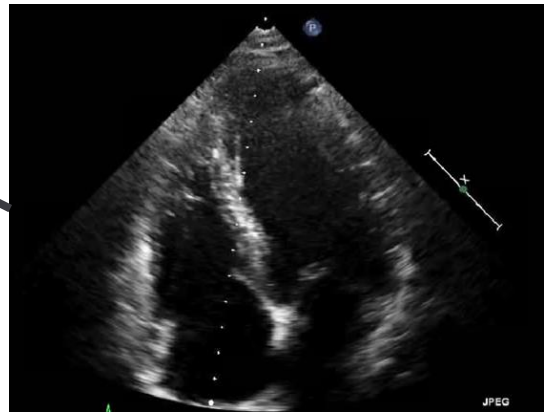
baseline



?



Arrhythmie auf Boden bestehender Herzinsuffizienz

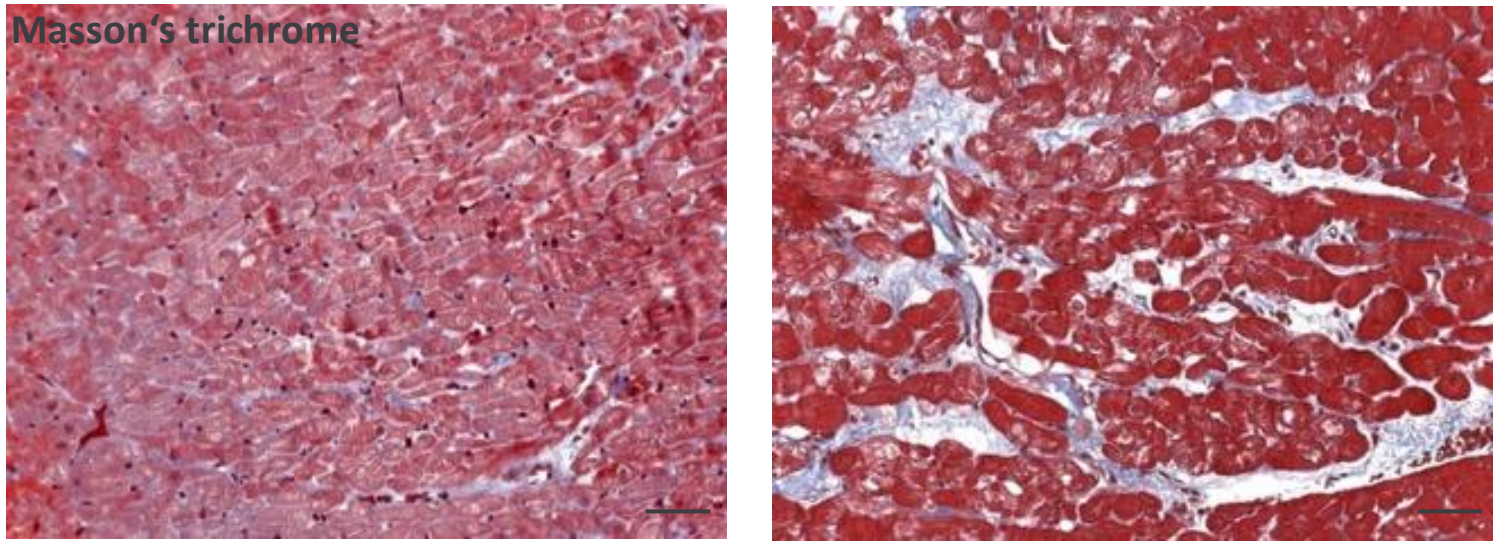


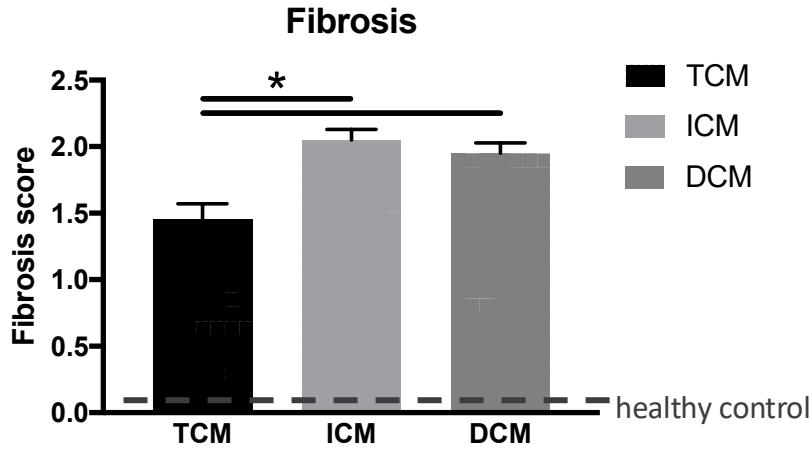
Arrhythmie-induzierte Kardiomyopathie

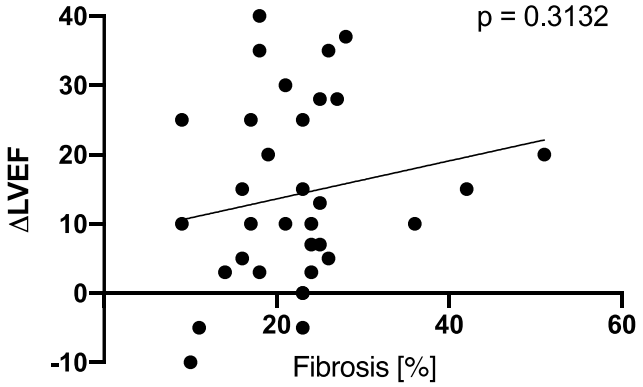
Vorhofflimmern HFrEF – wer profitiert am meisten?

gesund

Tachykardiomyopathy

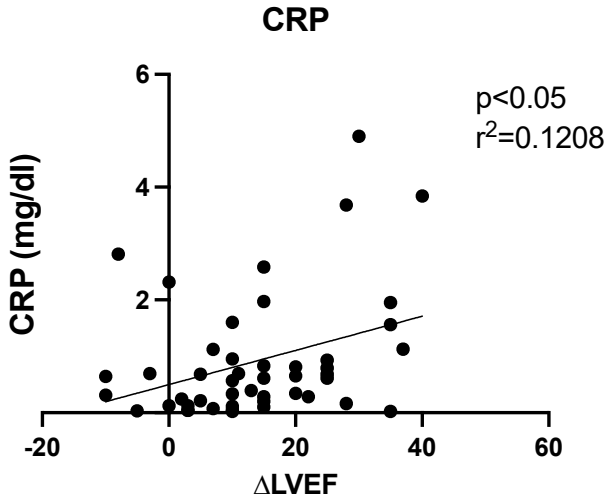


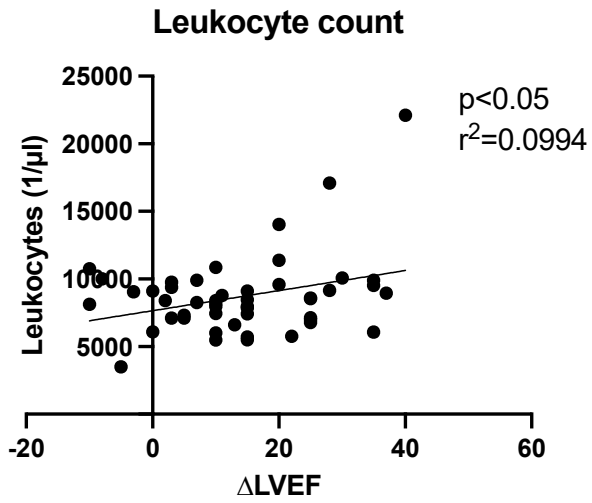


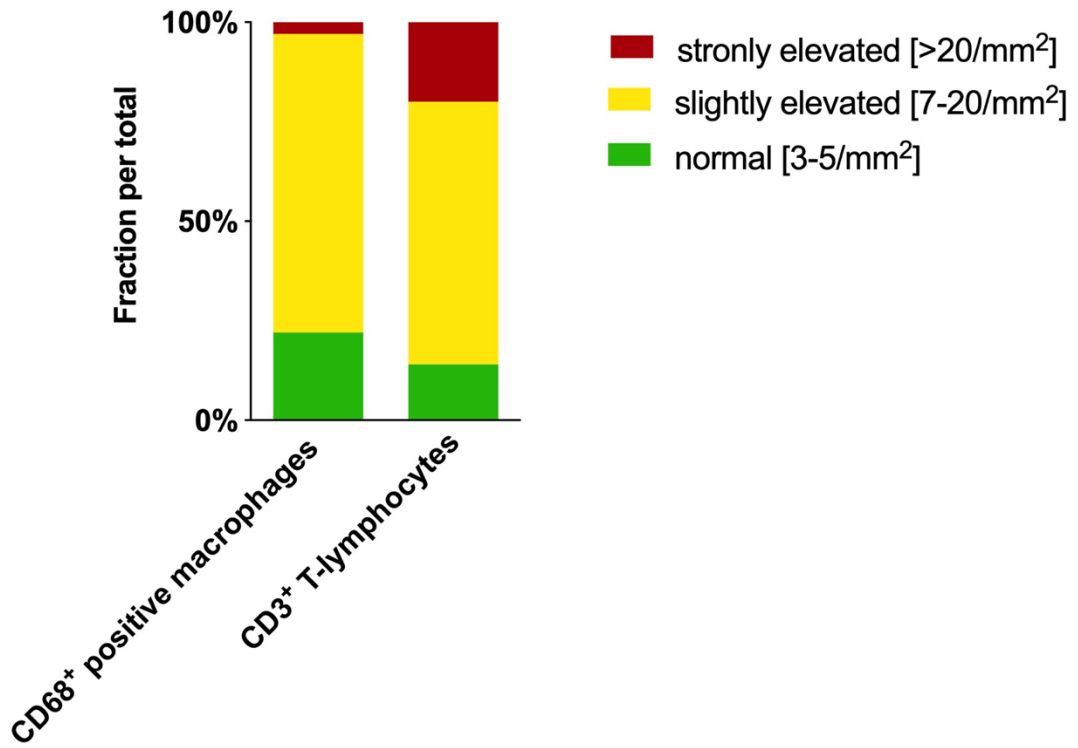


Mueller, Heinzmann, et al., JACC 2017
unpublished

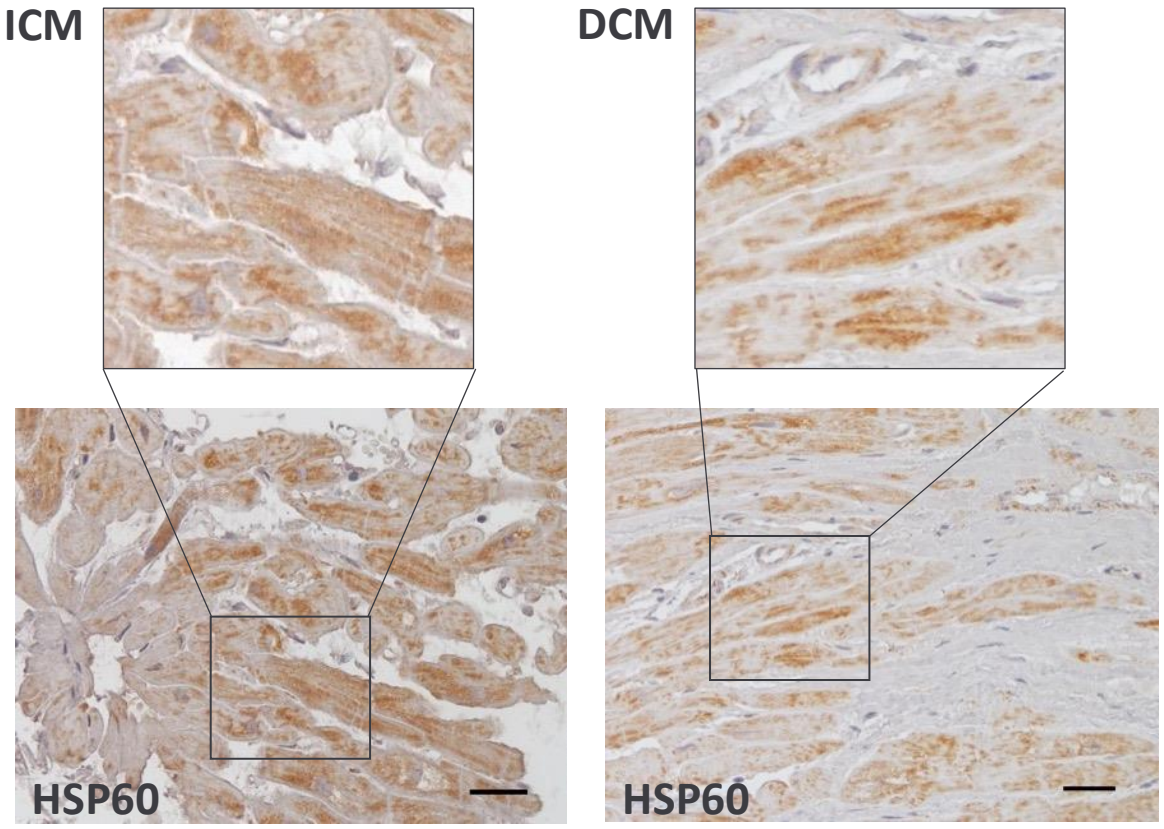
Vorhofflimmern HFrEF – wer profitiert am meisten?





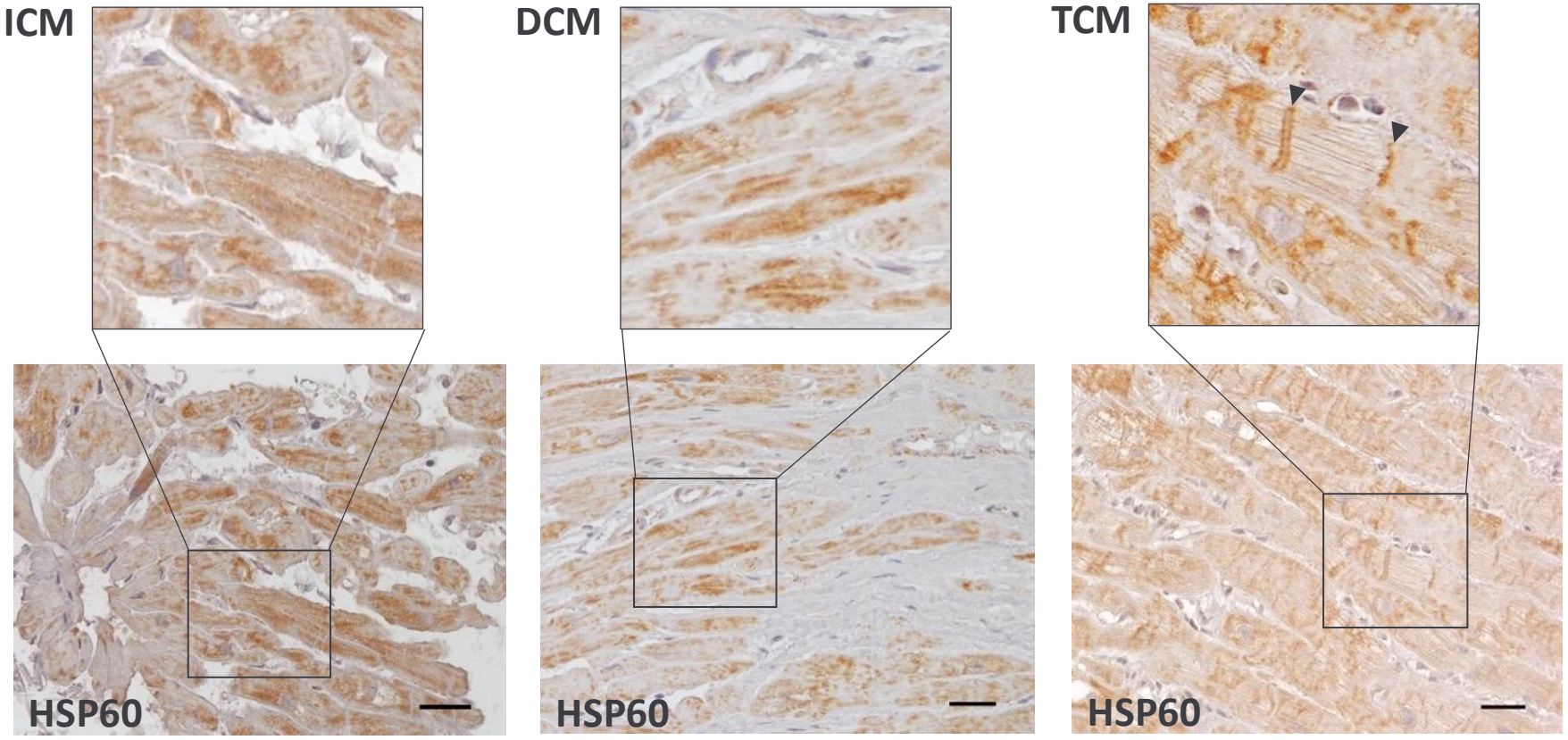


Vorhofflimmern HFrEF – wer profitiert am meisten?



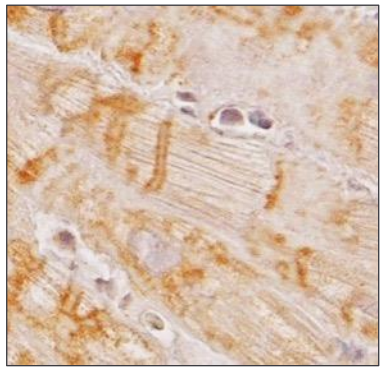
Mueller, Heinzmann, et al., JACC 2017

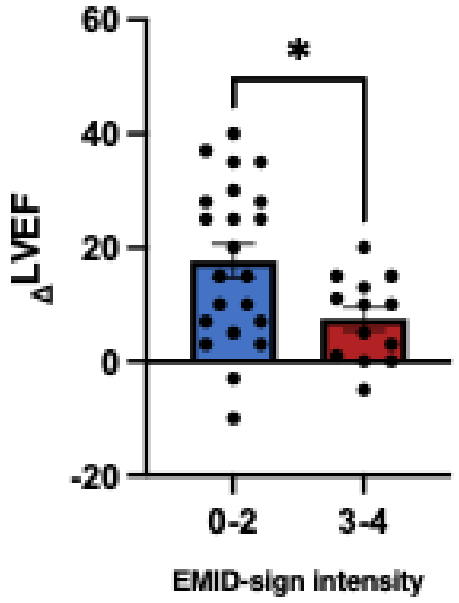
Vorhofflimmern HFrEF – wer profitiert am meisten?

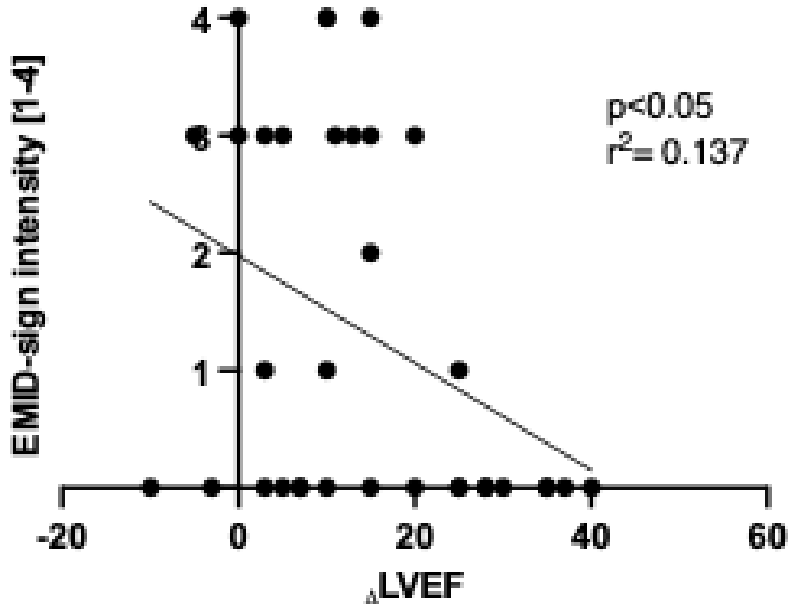


Mueller, Heinzmann, et al., JACC 2017

Vorhofflimmern HFrEF – wer profitiert am meisten?







unpublished

Zusammenfassung

- VHF spielt wichtige Rolle in täglicher Versorgungsrealität
- Auslösende/Prädisponierende Faktoren kontrollieren
- Optimale medikamentöse Therapie (Fantastic Four) als Basis
- Rhythmuskontrolle früh anstreben!
- Mehr Daten für Subgruppen (Tachykardiomyopathie, HFpEF, etc.) notwendig