L'essentiel de l'année en rythmologie

Arythmies

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Disclosures

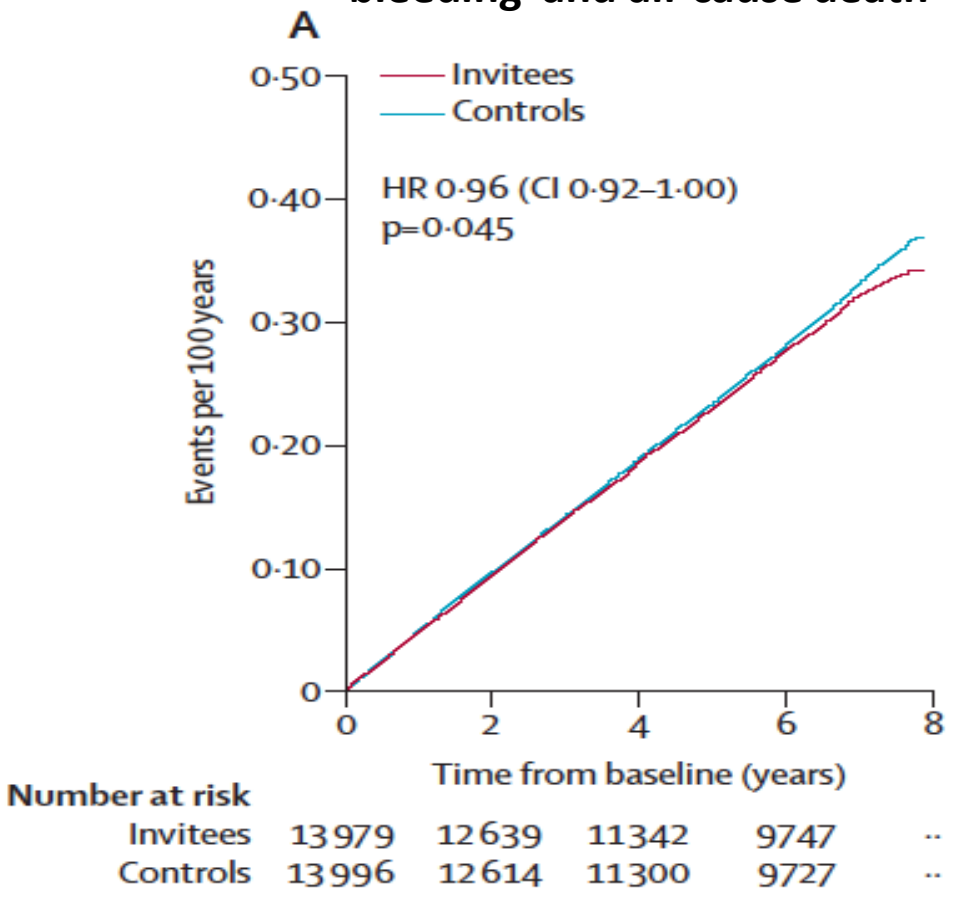
Laurent Fauchier:

Speaker or Consultant:	AstraZeneca, Bayer, BMS Pfizer, Boehringer Ingelheim, Medtronic, Novartis, Novo Nordisk, XO, Zoll

STROKESTOP

75 yo, intermittent ECGs for 14 days

Ischaemic or haemorrhagic stroke, SE, bleeding and all-cause death

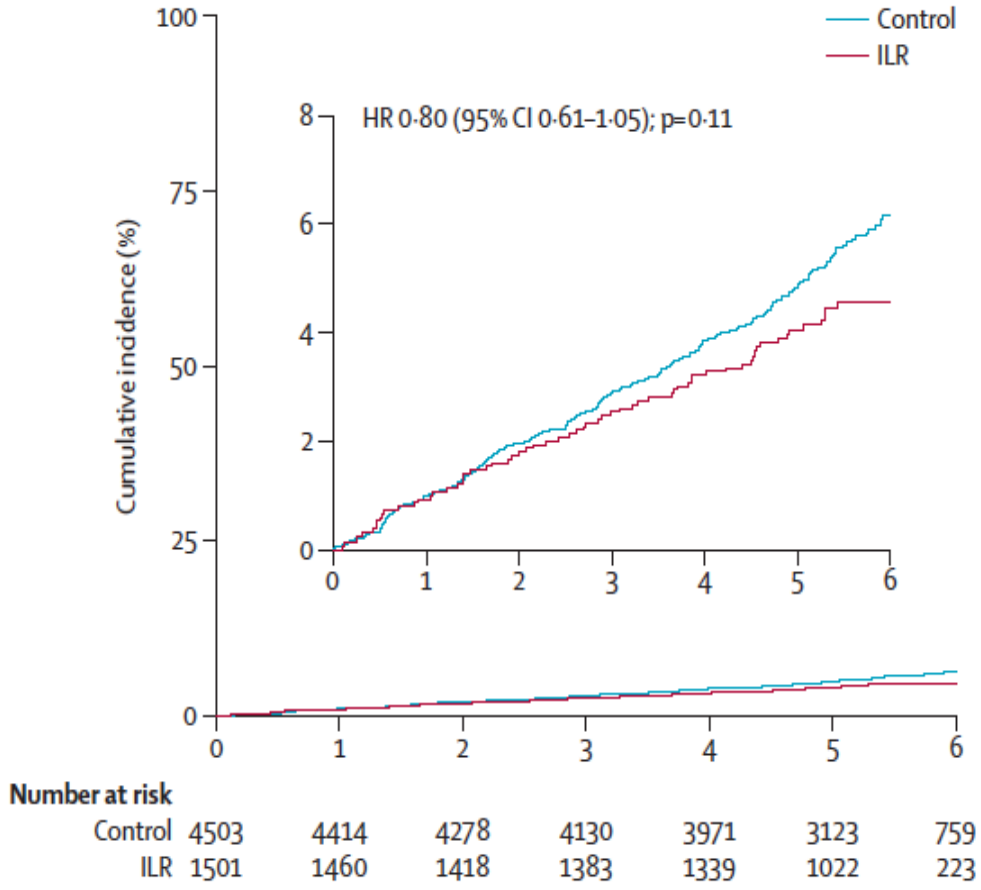


Svennberg E et al. *Lancet* 2021

LOOP

70–90 yo, ≥1 stroke risk factor, ILR

Stroke or systemic arterial embolism

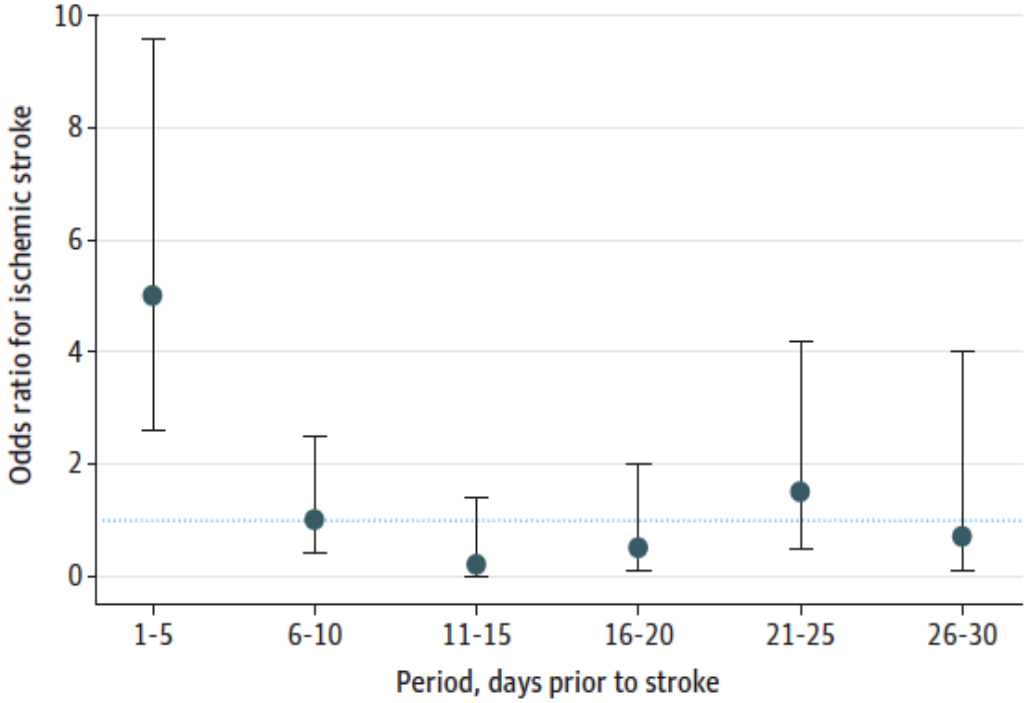


Svendsen JH et al. *Lancet* 2021

Temporal Association Between AF and Risk of Stroke

- 466,635 patients included in both the Optum electronic health record and CareLink databases
- 891 patients with CIEDs and ischemic stroke with continuous monitoring
- AF ≥5.5 hours on any given day during days 1-30 vs days 91-120 prestroke.
- No AF ≥5.5 hours in 2 periods: 682/891 (76.5%)
- AF ≥5.5 hours in 2 periods : 143/891 (16.0%)
- AF >23 hours on a given day: clear increase in stroke risk OR 5.0 (2.1-12.0)
- ***Conclusion****: Excess stroke risk highest within 5 days of an episode of AF of ≥5.5 hours and diminished rapidly thereafter.*

Figure. Odds Ratios for Ischemic Stroke for Sequential, Nonoverlapping 5-Day Intervals Containing at Least 1 Day With 5.5 Hours or More of Atrial Fibrillation

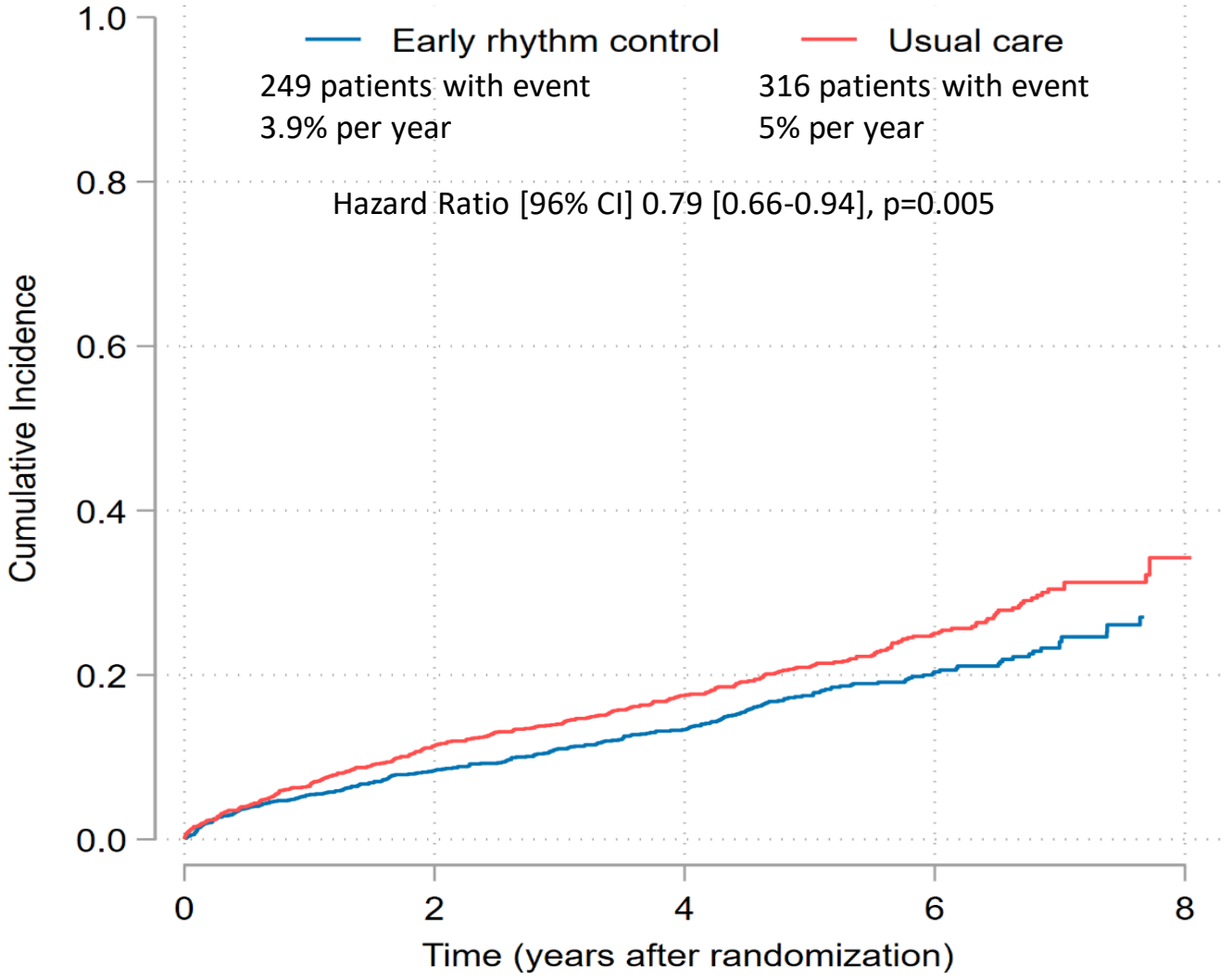


Singer D et al. *JAMA Cardiol* 2021

EAST – AFNET 4

Analysis of first primary outcome

Composite of CV death, stroke, or hosp. with worsening HF or ACS



Patients at risk

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

Kirchhof P et al. *NEJM* 2020

EAST – AFNET 4

CONSORT diagram

Kirchhof P et al.
***NEJM* 2020**

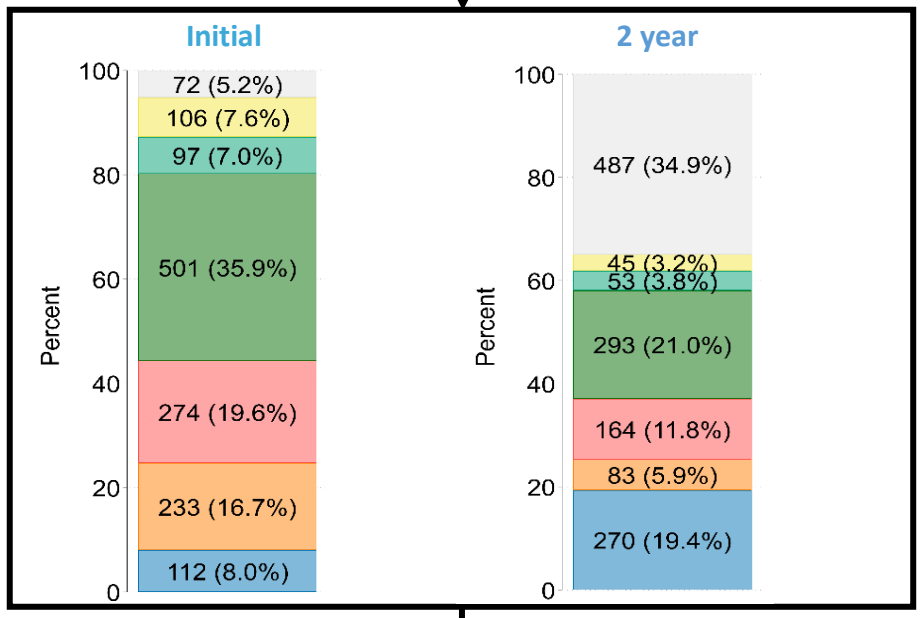
- Early AF (AF diagn. <1 year)
- + e.g. $CHA_2DS_2VASc \geq 2$

2789 patients randomized by 135 sites in 11 countries

Randomization

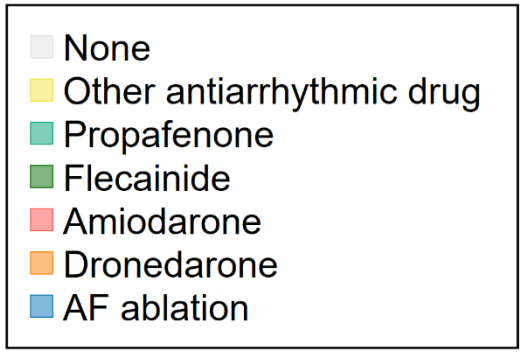
Early Rhythm Control (n=1,395)

Included in primary analysis n=1,395



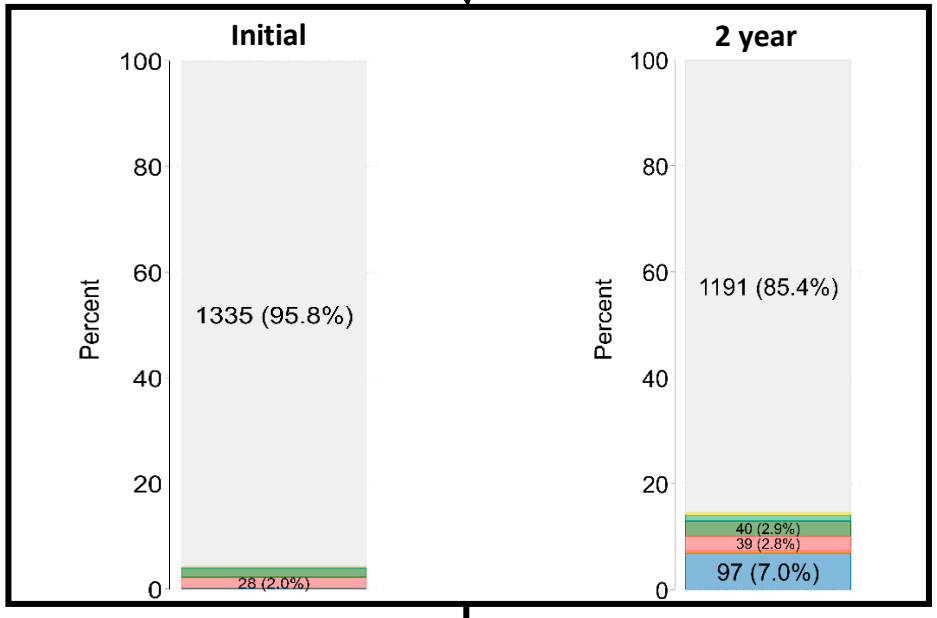
Total FU-years lost: 582/6963 (8.4%)

465 FU-years because 115 patients withdrew (6.7%)
117 FU-years lost to follow-up in 56 patients (1.7%)



Usual Care (n=1,394)

Included in primary analysis n=1,394



Total FU-years lost: 409/6859 (6.0%)

299 FU-years because 79 patients withdrew (4.4%)
110 FU-years lost to FU in 65 patients (1.6%)

EAST – AFNET 4

Analysis of primary and secondary outcomes

- CV death: 1 vs. 1.3/100 P-Y (HR 0.72, 95% CI 0.52-0.98)
- Stroke: 0.6 vs. 0.9/100 P-Y (HR 0.65, 95% CI 0.44-0.98)
- HF hospitalization: 2.1 vs. 2.6/100 P-Y
- ACS hospitalization: 0.8 vs. 1.0/100 P-Y

- **Secondary outcomes for rhythm control vs. usual care:**
- Nights spent in the hospital: 5.8 vs. 5.1 days
- Change in left ventricular ejection fraction at 2 years: 1.5 vs. 0.8%
- Sinus rhythm: 82.1% vs. 60.5% ($p < 0.05$)
- All-cause mortality: 9.9% vs. 11.8%
- Adverse event related to rhythm-control therapy: 4.9% vs. 1.4%

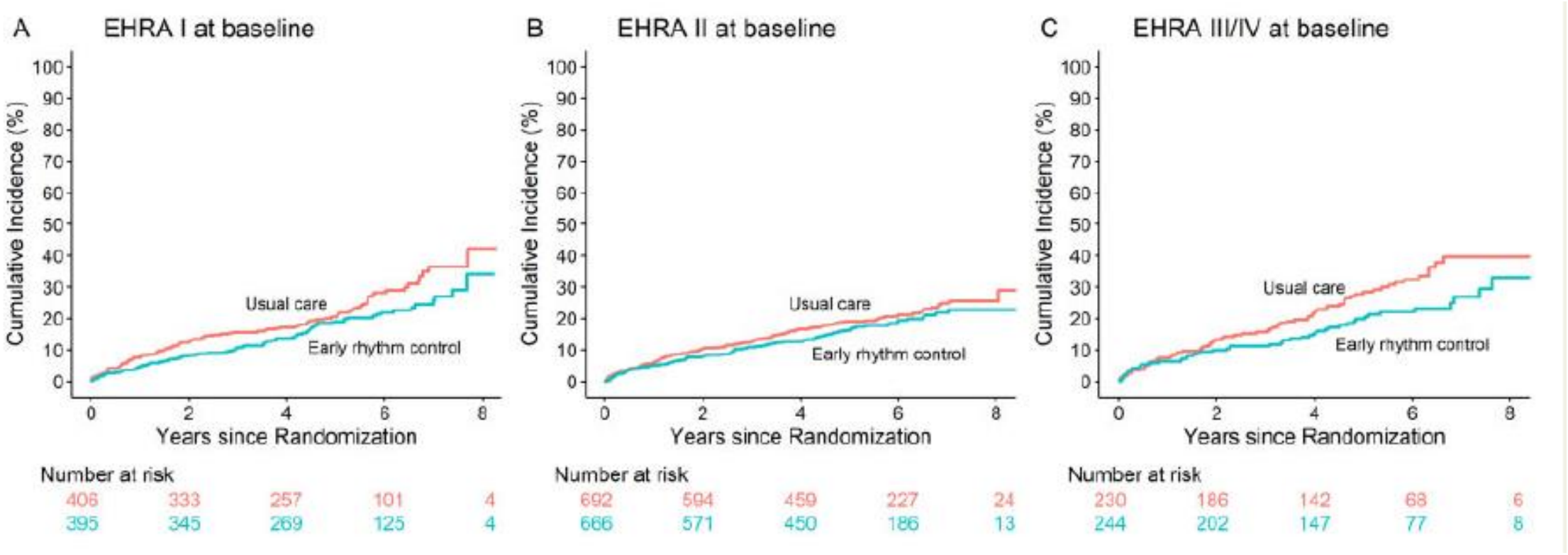
Kirchhof P et al. *NEJM* 2020

EAST. Early rhythm control in AF with or w/o symptoms

First primary outcome

Composite of CV death, stroke, or hosp. with worsening HF or ACS

HR 0.77 (0.57, 1.03) | HR 0.84 (0.66, 1.09) | HR 0.68 (0.47, 0.99)

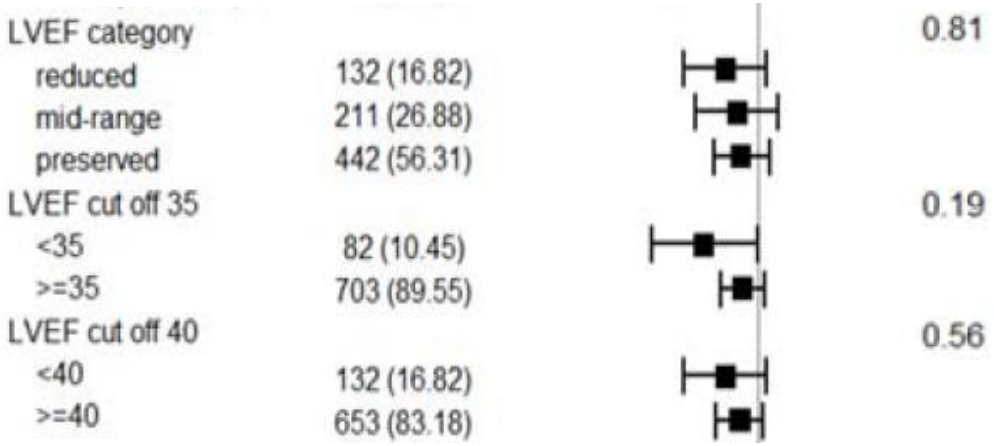


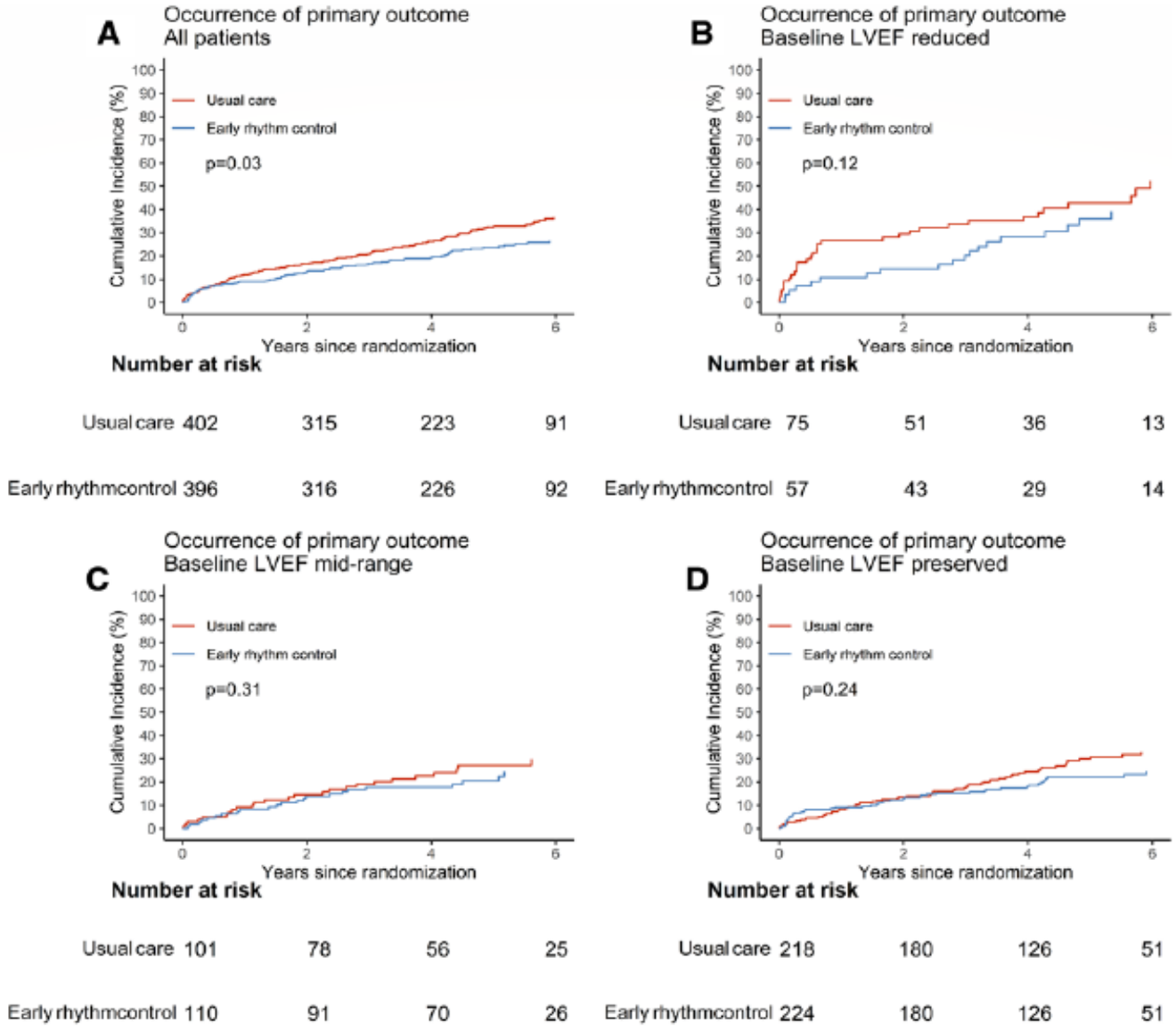
S. Willems et al, *EHJ* 2022

EAST. Early rhythm control in AF with HF

First primary outcome

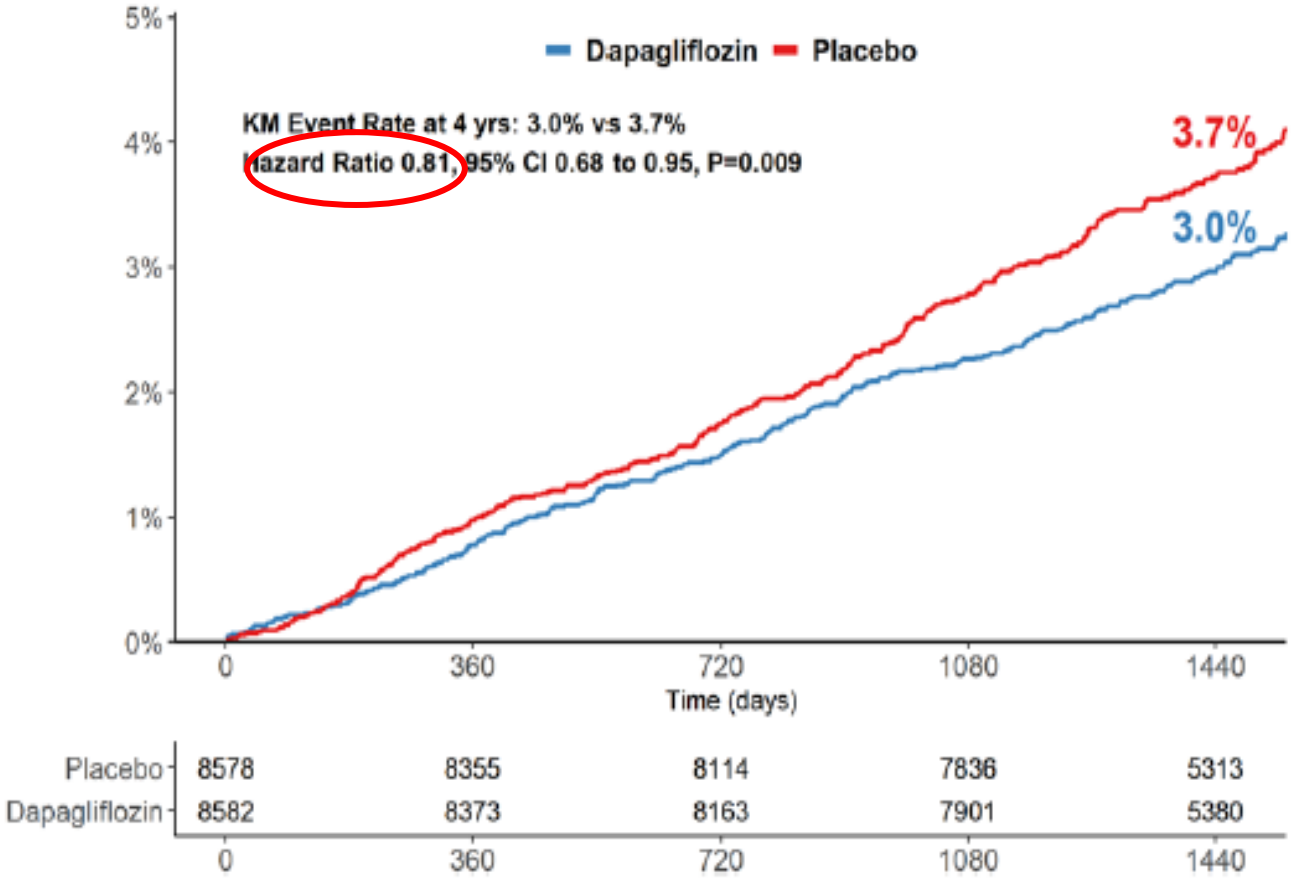
Composite of CV death, stroke, or hosp. with worsening HF or ACS

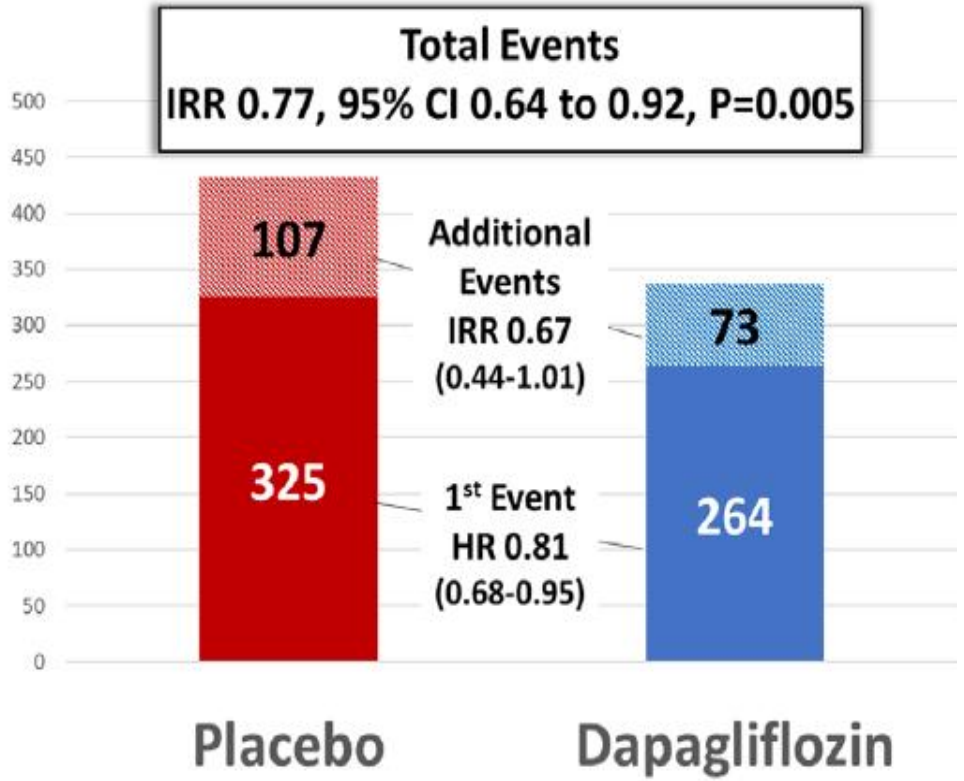




Rillig A et al, *Circulation* 2021

DECLARE-TIMI 58 Trial. Incidence of AF in T2DM





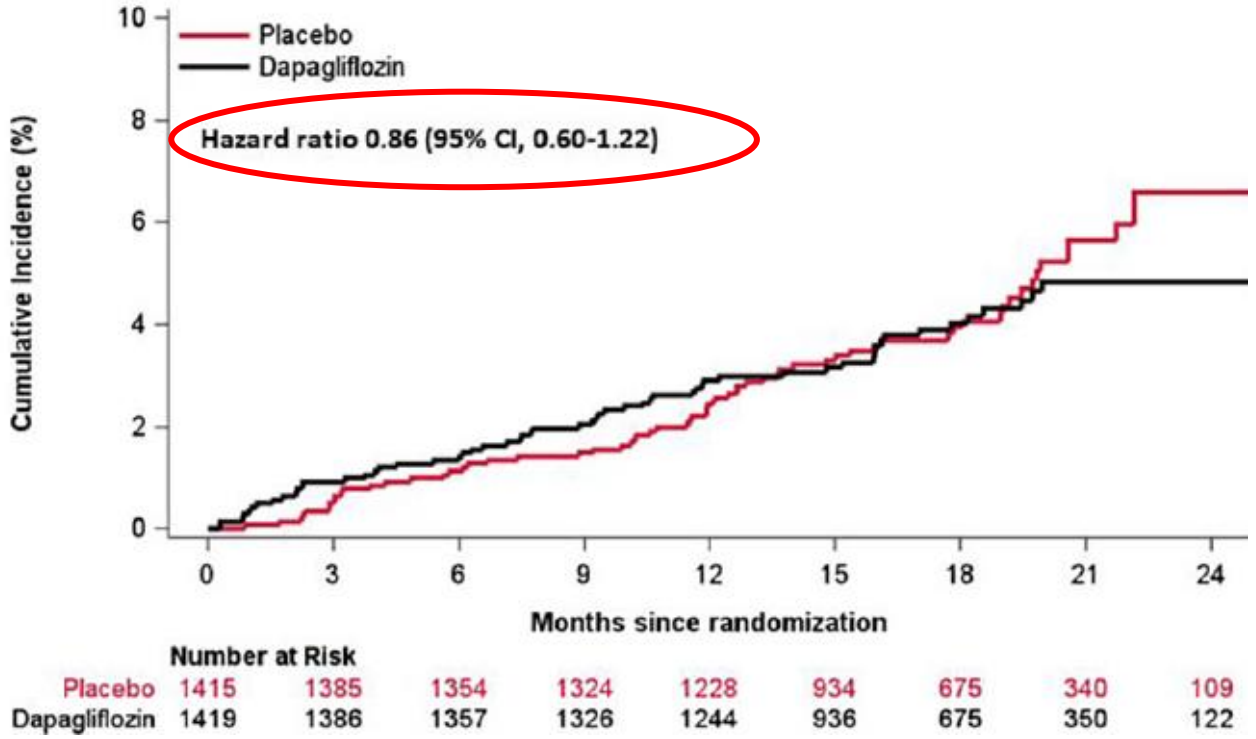
Granger and Mahaffey, *Circulation* 2020

DAPA-HF: Dapagliflozin and AF in HFrEF

Efficacy in case of AF :

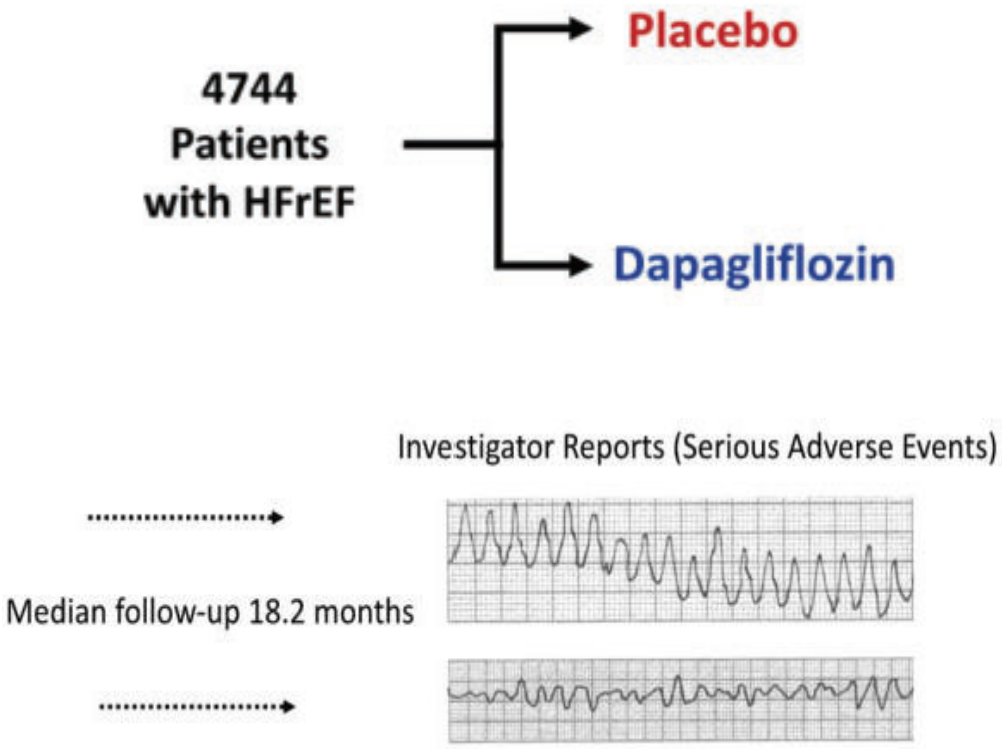
	Placebo	Dapagliflozin	Hazard ratio (95% CI)
Primary outcome			
All trial patients	21.2%	16.3%	0.74 (0.65 - 0.85)
No AF	19.9%	15.0%	0.74 (0.62 - 0.88)
Any AF	23.1%	18.1%	0.75 (0.62 - 0.92)
Paroxysmal AF	21.5%	18.1%	0.83 (0.59 - 1.15)
Persistent/permanent AF	24.1%	18.2%	0.72 (0.56 - 0.92)
AF on ECG	22.5%	19.2%	0.82 (0.63 - 1.06)

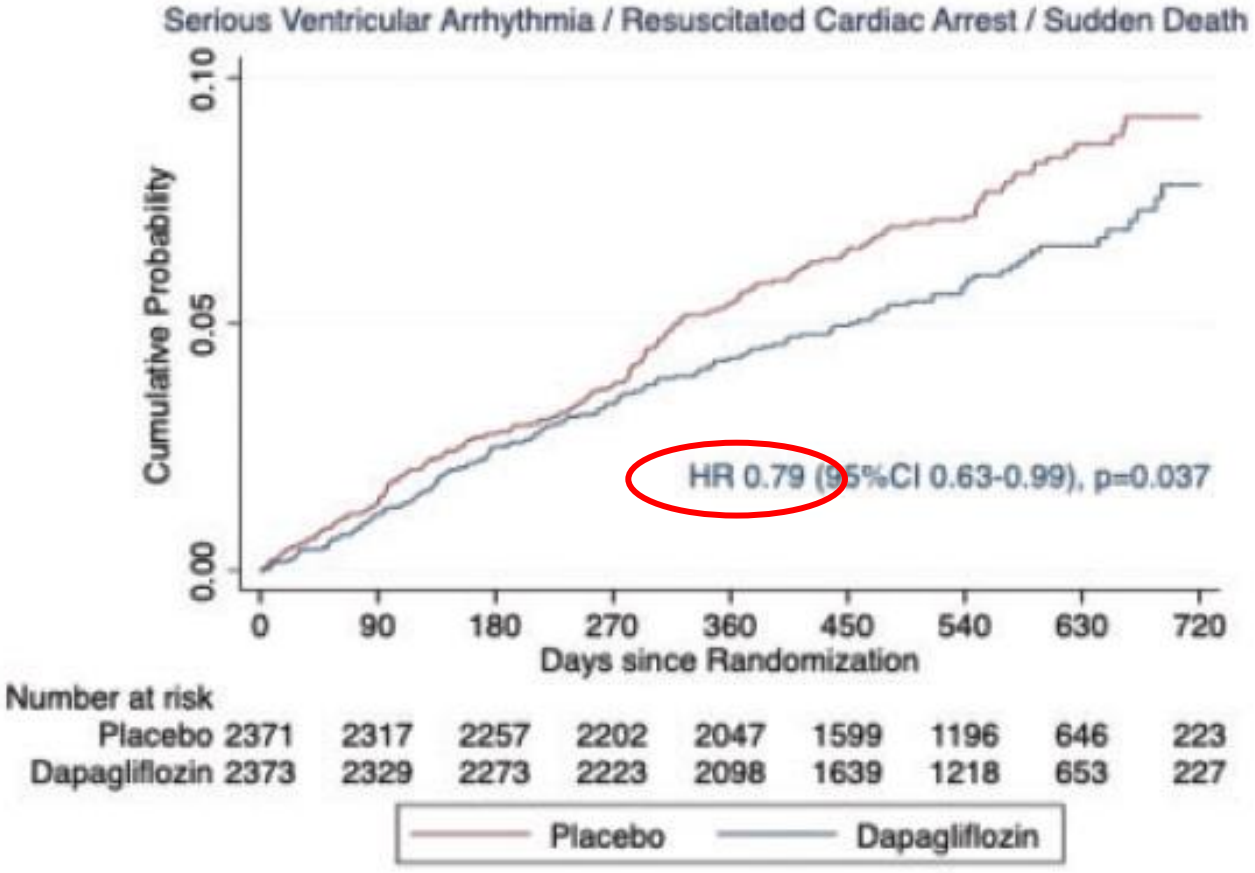
New-onset AF :



Butt JH,
Eur J Heart Fail 2021

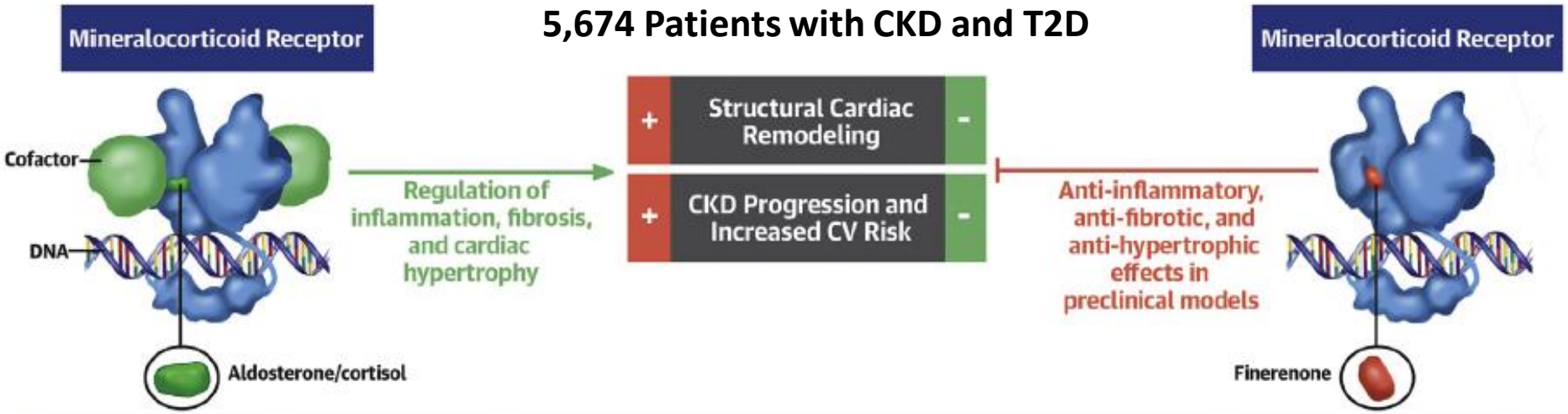
DAPA-HF :
Dapagliflozin and ventricular tachyarrhythmias

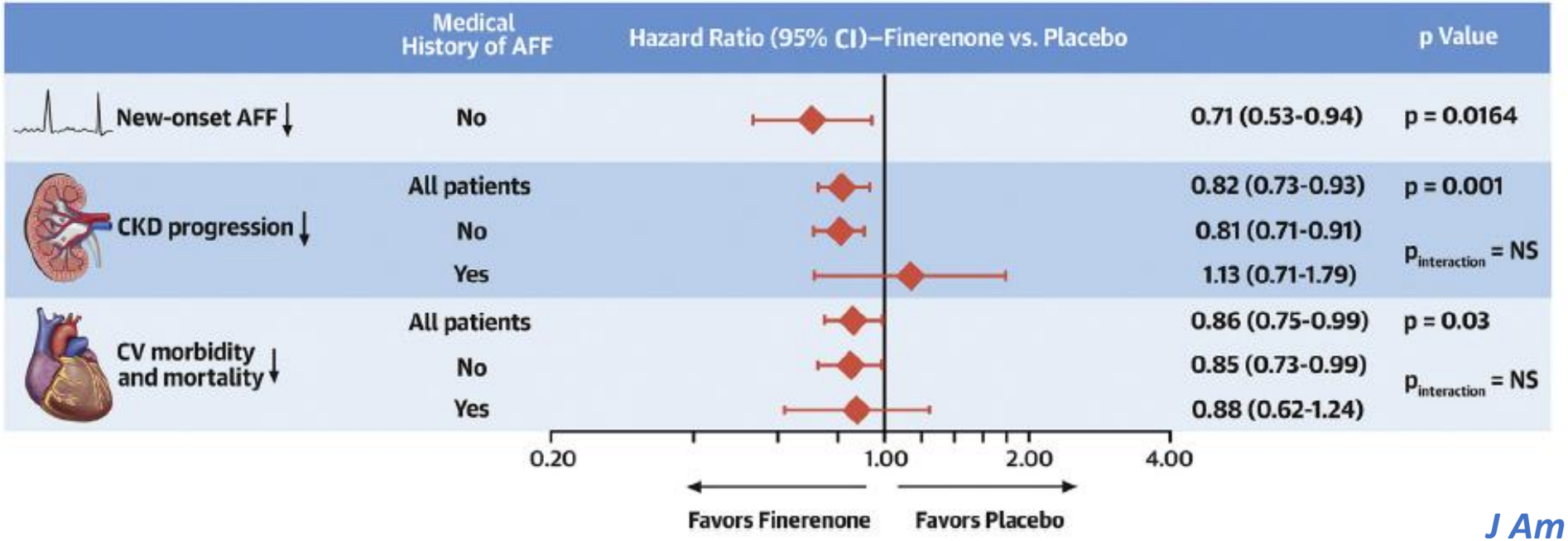




Curtain JP et al, *Eur Heart J* 2021

New-Onset AF and Outcomes in FIDELIO-DKD



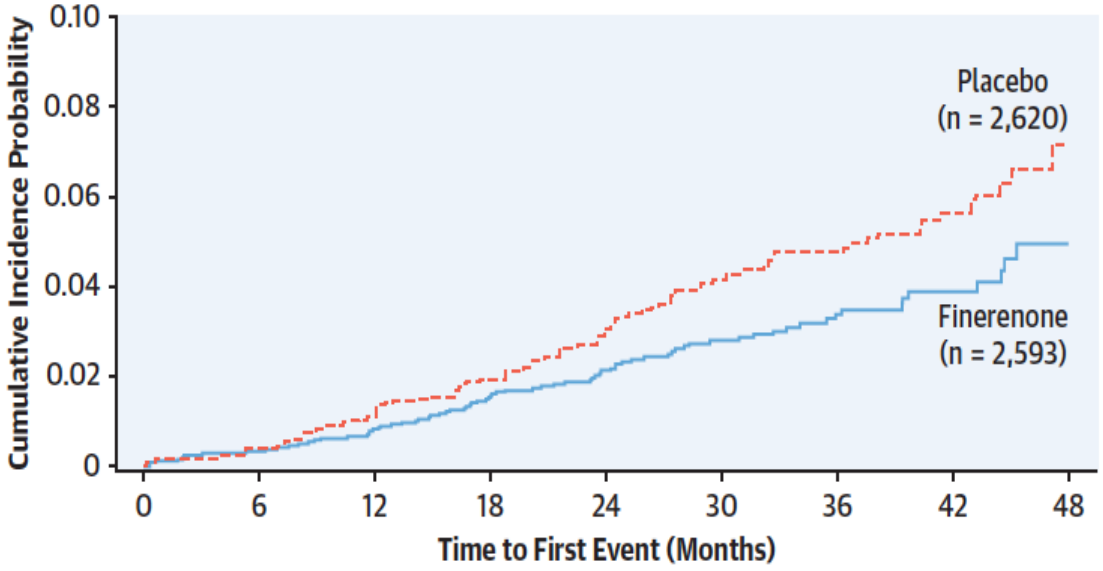


Filippatos G et al,
J Am Coll Cardiol J 2021

New-Onset AF in FIDELIO-DKD

- **5,674 Patients with CKD and T2D**

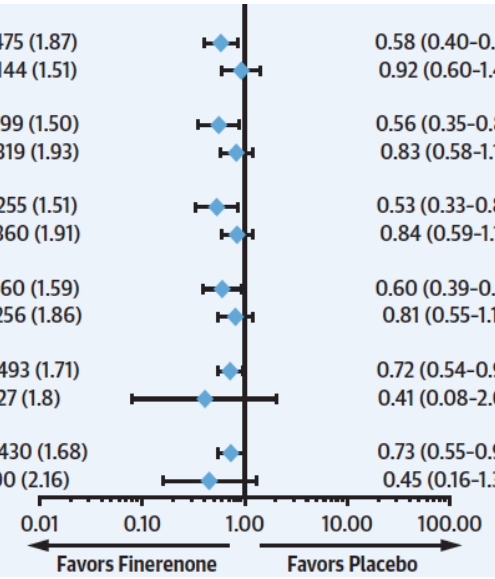
Finerenone = 82/2,593 (3.2%; incidence: 1.20 per 100 PY; 95% CI: 0.96-1 .48)
Placebo = 117/2,620 (4.5%; incidence: 1.72 per 100 PY; 95% CI: 1.42-2.04)
HR: 0.71 (95% CI: 0.53-0.94); p = 0.0164



Number of patients at risk

Finerenone	2,593	2,563	2,524	2,459	1,939	1,444	961	539	109
Placebo	2,620	2,580	2,532	2,463	1,914	1,446	945	552	112

Subgroup	Finerenone n/N (n per 100 PY)	Placebo n/N (n per 100 PY)	Hazard Ratio (95% CI)	p Value for Interaction
All patients	82/2,593 (1.20)	117/2,620 (1.72)	0.71 (0.53-0.94)	
Age at run-in visit				0.48
<65 years	21/1,149 (0.70)	25/1,135 (0.84)	0.85 (0.47-1.52)	
≥65 years	61/1,444 (1.60)	92/1,485 (2.40)	0.67 (0.48-0.92)	
Sex				0.37
Male	59/1,767 (1.26)	91/1,848 (1.90)	0.66 (0.47-0.91)	
Female	23/826 (1.08)	26/772 (1.29)	0.89 (0.51-1.57)	
Baseline eGFR				0.06
<25 ml/min/1.73 m²	4/58 (2.75)	3/63 (1.99)	1.25 (0.27-5.66)	
25-<45 ml/min/1.73 m²	51/1,349 (1.47)	56/1,381 (1.56)	0.95 (0.65-1.38)	
45-<60 ml/min/1.73 m²	24/895 (1.01)	43/859 (1.94)	0.53 (0.32-0.87)	
≥60 ml/min/1.73 m²	3/290 (0.37)	15/316 (1.74)	0.22 (0.06-0.76)	
Baseline potassium				0.12
≤4.4 mEq/l (median)	43/1,480 (1.10)	73/1,475 (1.87)	0.58 (0.40-0.85)	
>4.4 mEq/l (median)	39/1,112 (1.34)	44/1,144 (1.51)	0.92 (0.60-1.42)	
Baseline SBP				0.19
≤138.3 mm Hg (median)	28/1,263 (0.84)	51/1,299 (1.50)	0.56 (0.35-0.88)	
>138.3 mm Hg (median)	54/1,327 (1.56)	66/1,319 (1.93)	0.83 (0.58-1.18)	
Baseline BMI				0.13
<30 kg/m²	25/1,234 (0.77)	49/1,255 (1.51)	0.53 (0.33-0.86)	
≥30 kg/m²	57/1,348 (1.62)	68/1,360 (1.91)	0.84 (0.59-1.19)	
Baseline HbA1c				0.32
≤7.5%	34/1,316 (0.97)	57/1,360 (1.59)	0.60 (0.39-0.92)	
>7.5%	48/1,270 (1.46)	60/1,256 (1.86)	0.81 (0.55-1.18)	
SGLT-2i at baseline				0.49
No	80/2,485 (1.22)	111/2,493 (1.71)	0.72 (0.54-0.96)	
Yes	2/108 (0.72)	6/127 (1.8)	0.41 (0.08-2.03)	
GLP-1RA at baseline				0.39
No	77/2,421 (1.21)	106/2,430 (1.68)	0.73 (0.55-0.99)	
Yes	5/172 (1.08)	11/190 (2.16)	0.45 (0.16-1.31)	

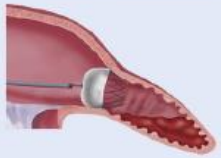


Filippatos G et al, *J Am Coll Cardiol J* 2021

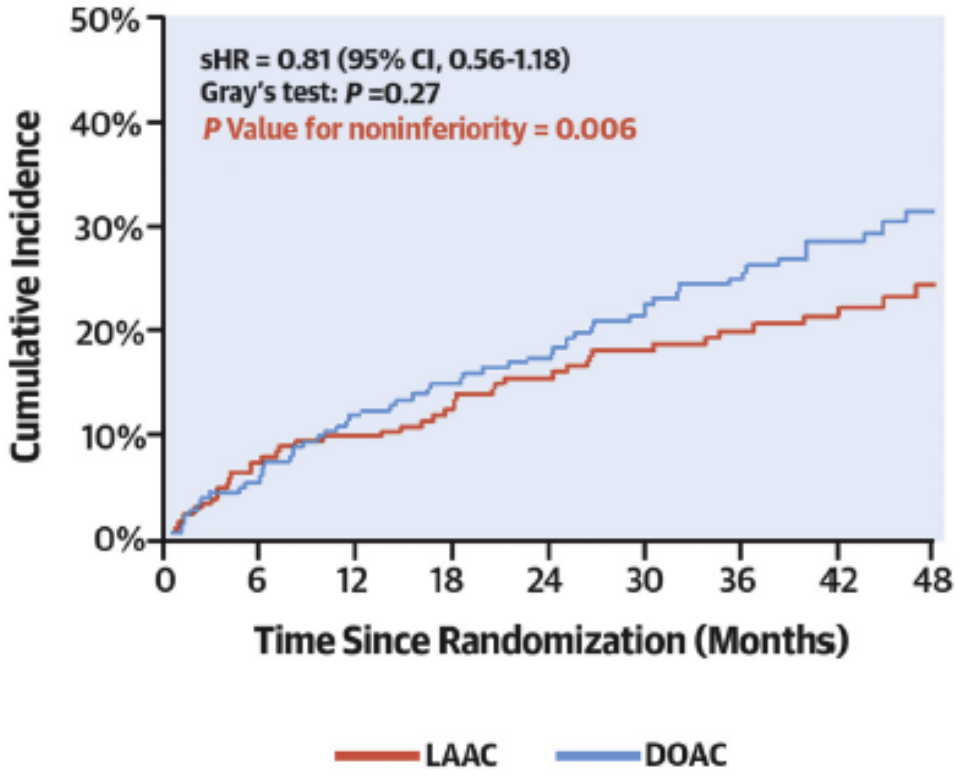
LAAC Vs DOACs: Long-Term Results of PRAGUE-17

PRAGUE-17 Trial: Long-Term (4-Year) Follow-Up

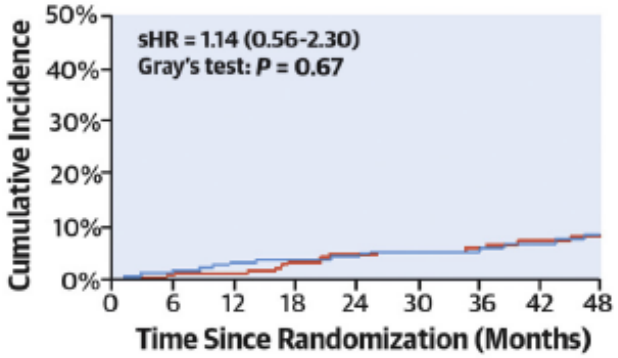
- 402 High-risk AF pts ➡ Randomized
  - CHA_2DS_2-VASc = 4.7 ± 1.5
  - HAS-BLED = 3.1 ± 0.9
- Median Follow-up: 3.5 years (IQR 2.6-4.3), 1,354 pt-year



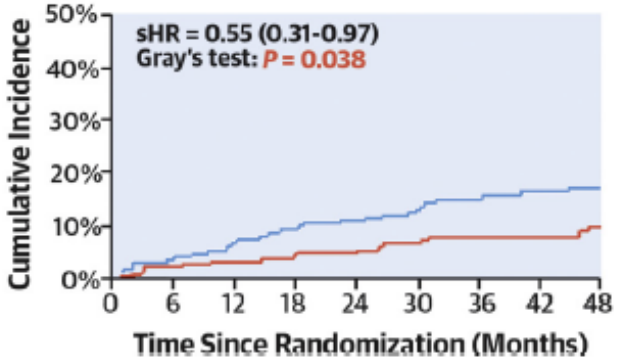
Primary Endpoint
Stroke, TIA, SE, CV Death, Bleeding or Complications



Stroke or TIA



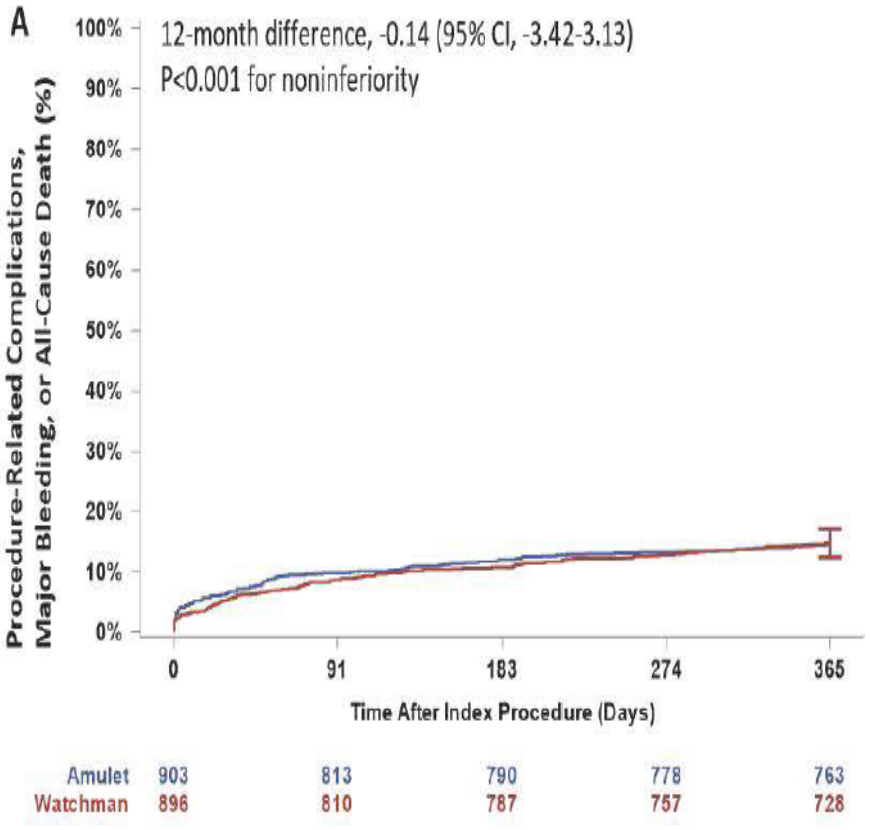
Non-Procedural Clinically Relevant Bleeding

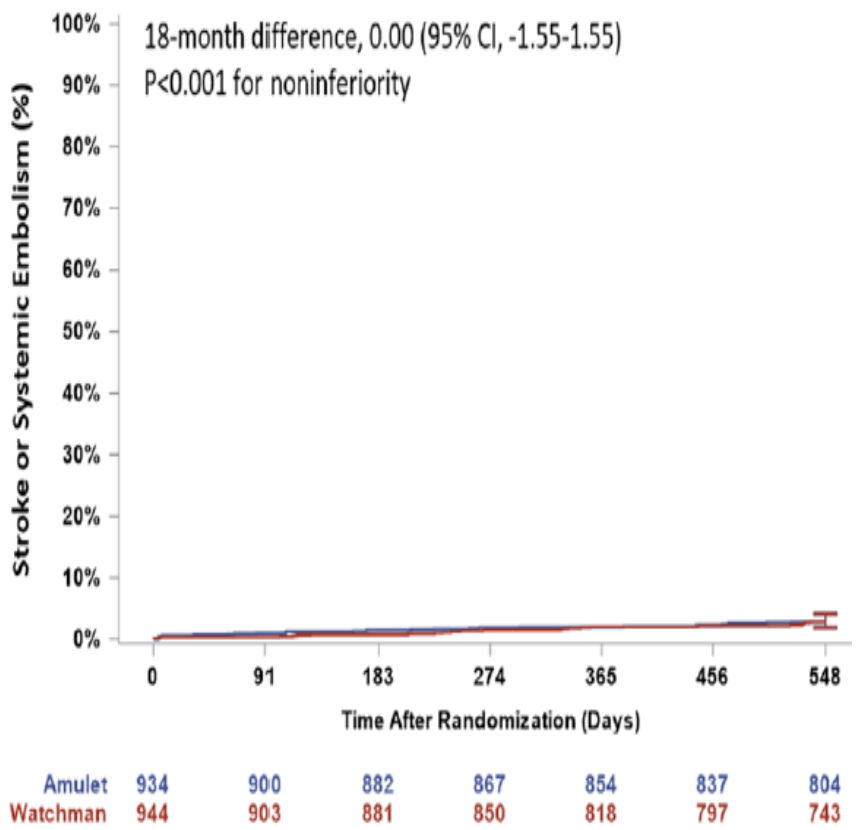


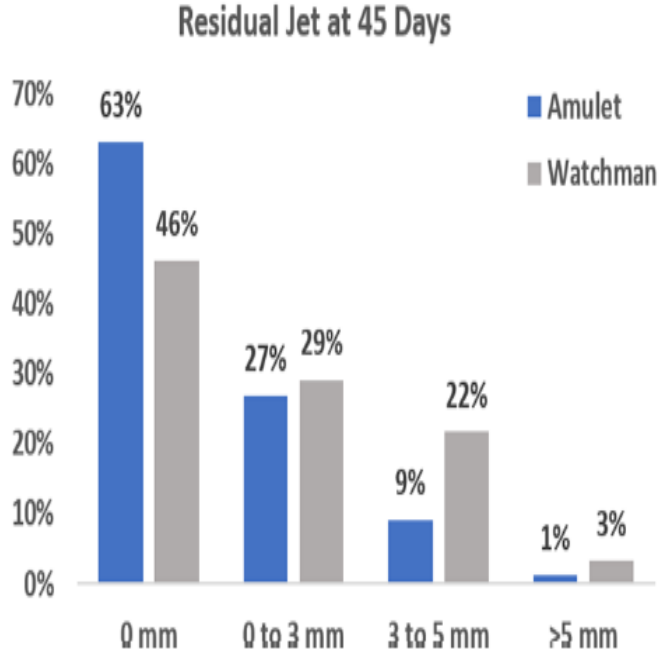
Osmancik P et al., *J Am Coll Cardiol* 2022

Amulet IDE Trial

- 1878 patients randomized to Amulet LAA occluder vs Watchman device
- Safety at 12-month FU, efficacy at 18-month FU







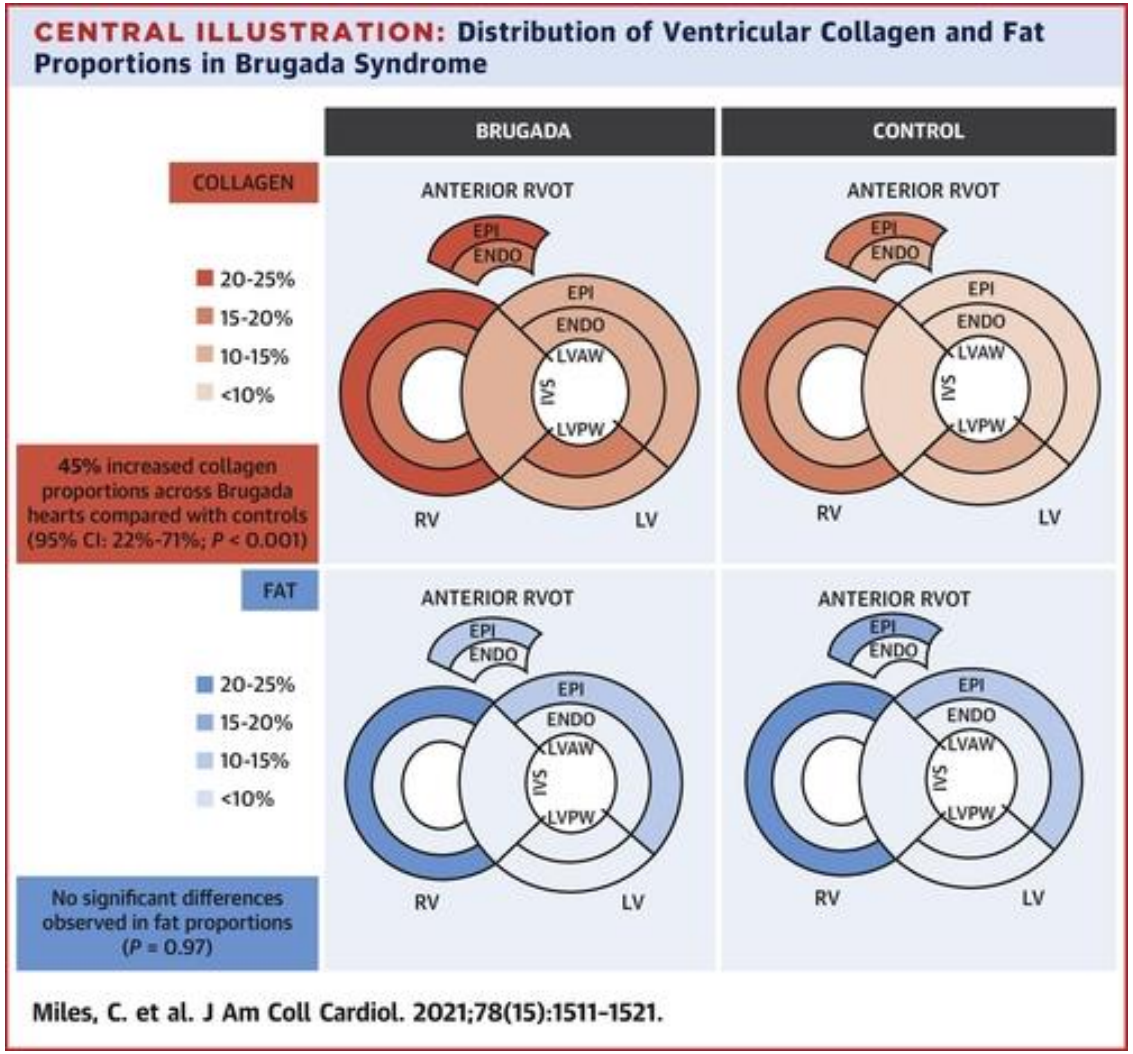
Lakkireddy et al., *Circulation* 2021

Biventricular Myocardial Fibrosis in Brugada Syndrome

- 28 hearts from consecutive sudden death cases attributed to BrS
- 29 hearts from a comparator group with noncardiac deaths (controls)
- Collagen and tissue composition with image analysis software

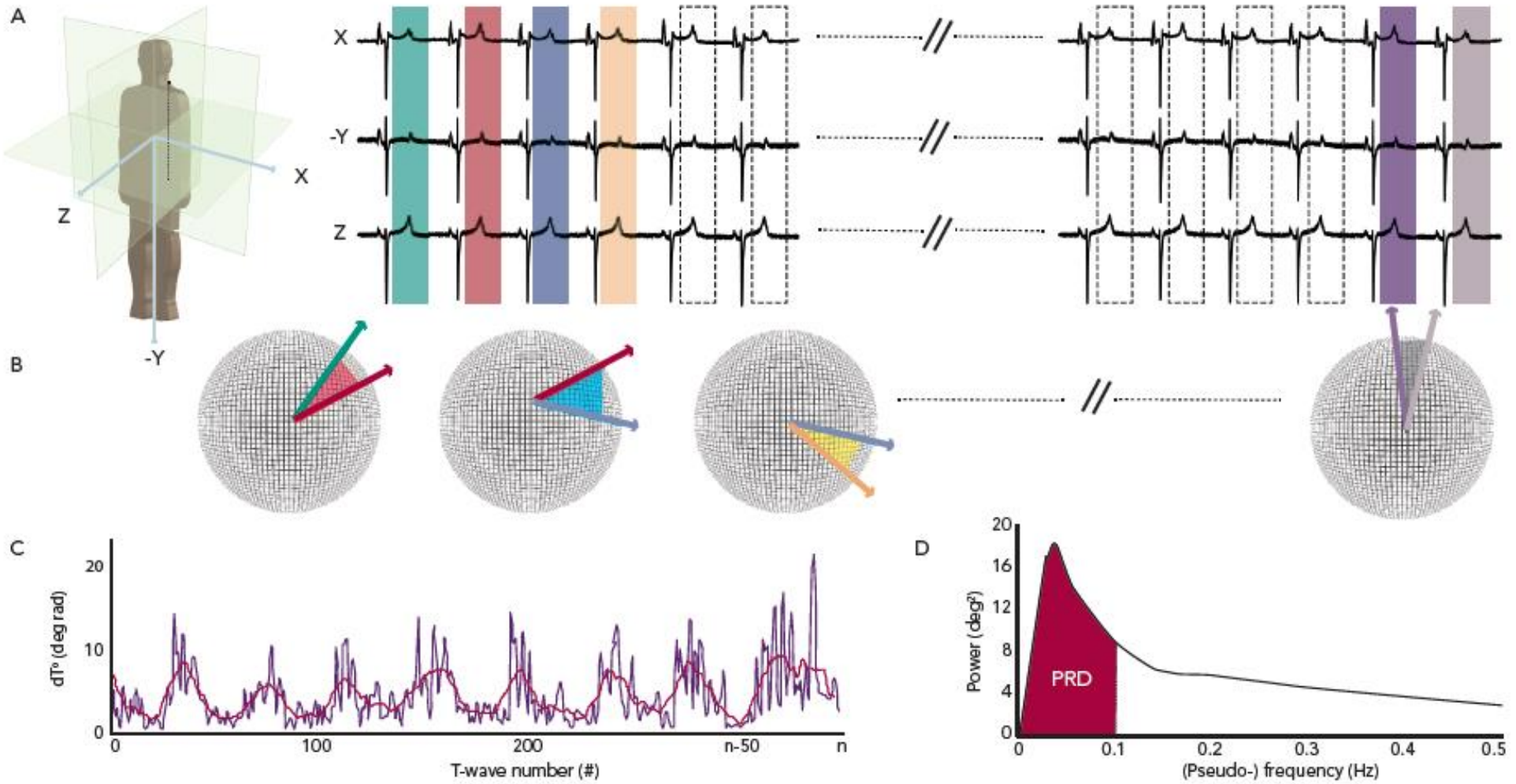
<u>28 BrS decedents</u>

- 75% men; median age death 25 years
- Death in sleep or at rest: 24/28 (86%).
- Highest proportion of collagen in the epicardial RVOT of the BrS group (23.7%).
- Higher proportion of collagen in ventricular myocardium for BrS decedents vs control (ratio 1.45; 95% CI 1.22-1.71; p<0.001)



Mules C et al, *J Am Coll Cardiol* 2021

Figure 1. Calculation of Periodic Repolarisation Dynamics

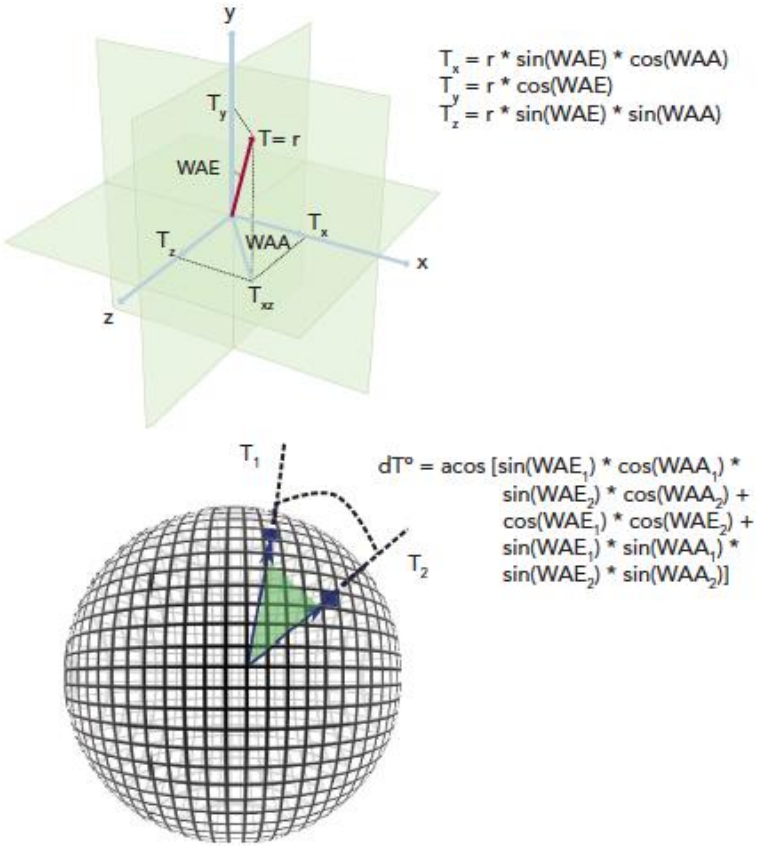


A: Assessment of PRD using a surface ECG recorded in the Frank leads configuration. B: Each T-wave is condensed into a weight-averaged vector of repolarisation (T°). B and C: The angle dT° between two successive repolarisation vectors T° is illustrated in the virtual spheres (B) and is calculated for the entire ECG (C). D: The emerging signal features periodic modulations in the low-frequency range (red line). PRD was quantified by means of wavelet analysis. PRD = periodic repolarisation dynamic.

Rizas KD et al. *Arrhythm Electrophysiol Rev* 2016

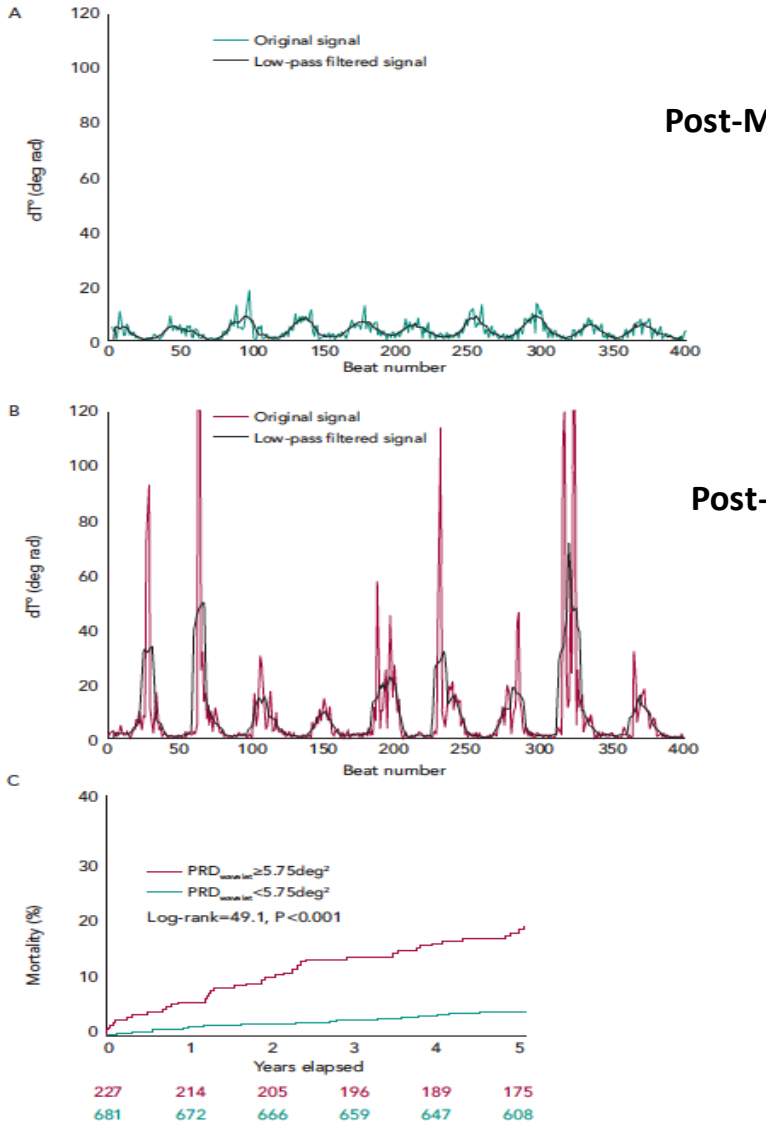
Periodic Repolarisation Dynamics

Figure 2: Calculation of the Angle dT° Between Two Successive Repolarisation Vectors T1 and T2



Projection of a vector T on the three orthogonal axes X, Y and Z (upper panel). Two repolarisation vectors T1 and T2 with length r are projected on a virtual sphere (lower panel). The dot product of the two vectors is used to calculate the angle dT° between T1 and T2. WAA = weight-averaged azimuth; WAE = weight-averaged elevation.

Figure 3: Periodic Repolarisation Dynamics in post-MI Patients

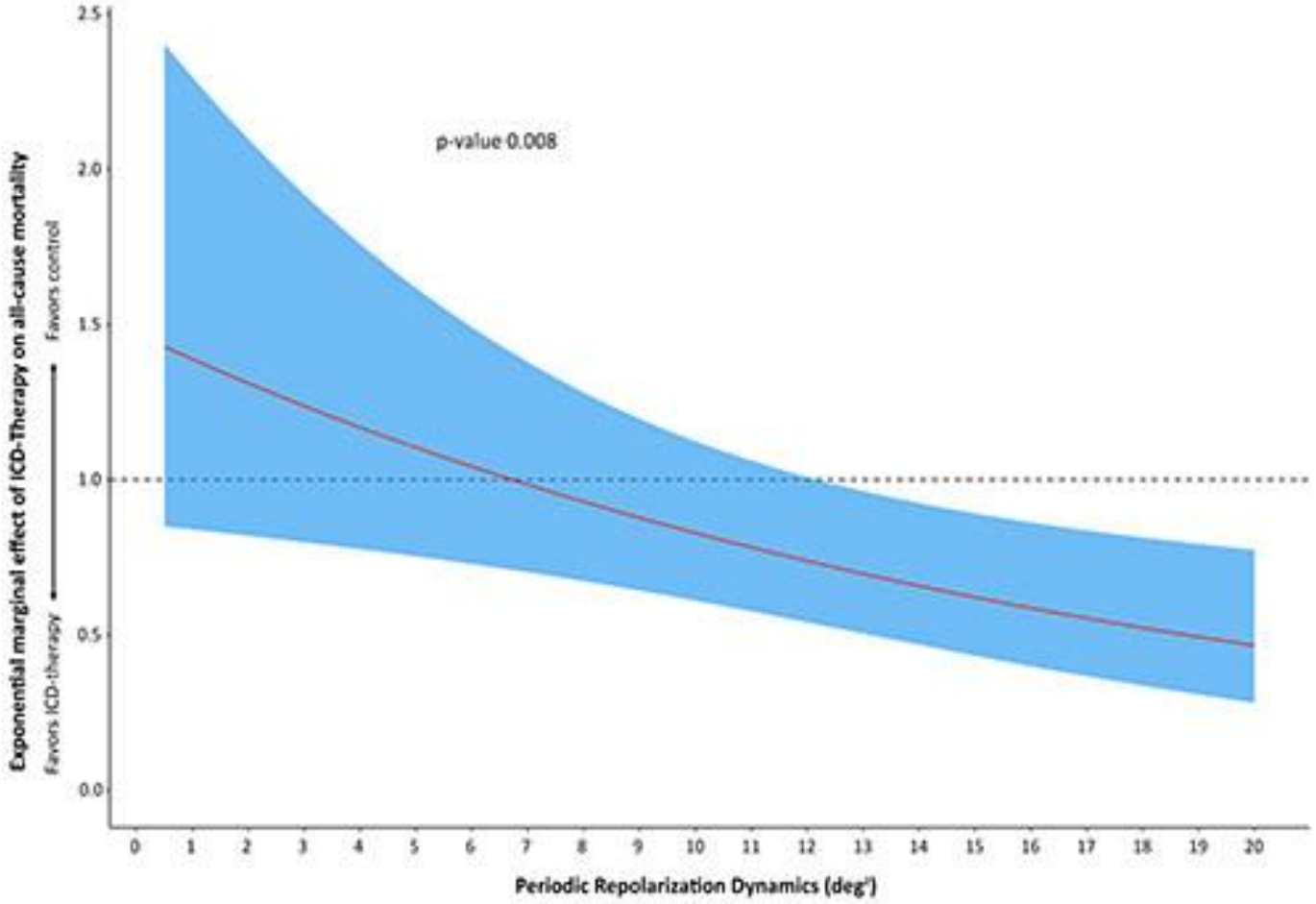


Typical dT° signals obtained from post-MI patients who survived (A, green line) and did not survive (B, red line) the 5-year follow-up period. Both signals show characteristic low-frequency oscillations (black line). However, the amplitude of those oscillations is substantially enhanced in the non-survivor. Cumulative mortality rates of patients stratified by PRD ≥5.75 deg2 (C). PRD = periodic repolarisation dynamic.

Rizas KD et al. *Arrhythm Electrophysiol Rev* 2016

DANISH: Periodic Repolarization Dynamics in NICM

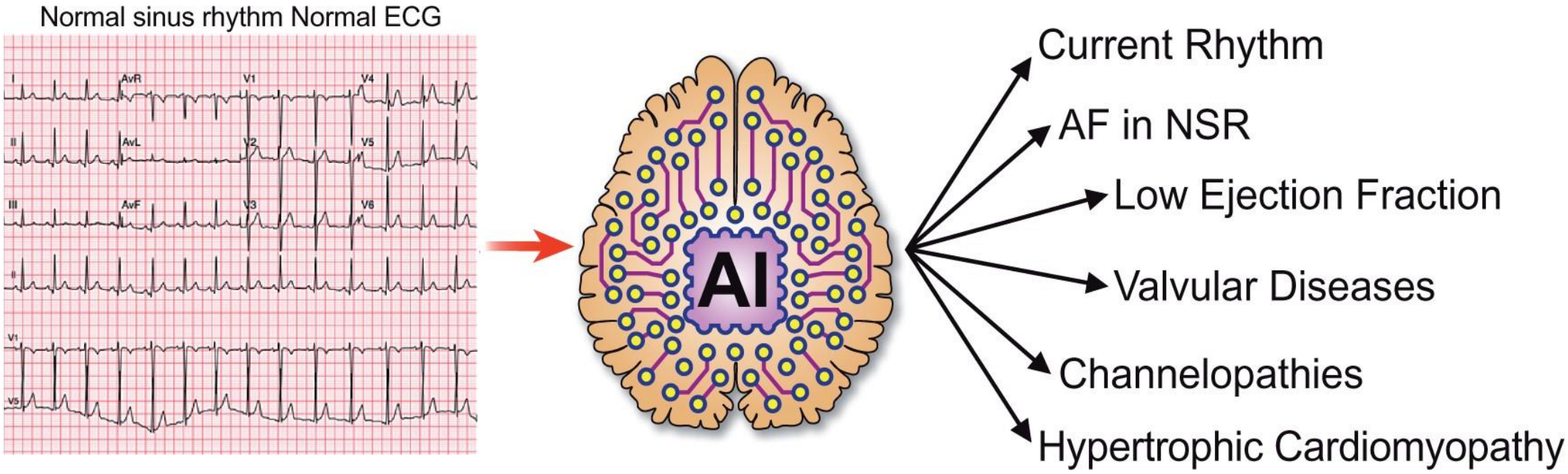
- PRD-substudy: 24-h Holter & technically acceptable ECG signals
- 748/1,116 DANISH patients in the PRD-substudy
- Increased PRD identified patients with NICM, where prophylactic ICD-implantation led to significant mortality reduction.



Boas R et al, *Circulation* 2021

Artificial intelligence and the electrocardiogram

- The application of artificial intelligence to the standard electrocardiogram enables it to diagnose ...



Attia ZI et al, *Eur Heart J* 2021