



SCOMPENSO CARDIACO

Terapia medica ottimale: “the fabulous four” e oltre?

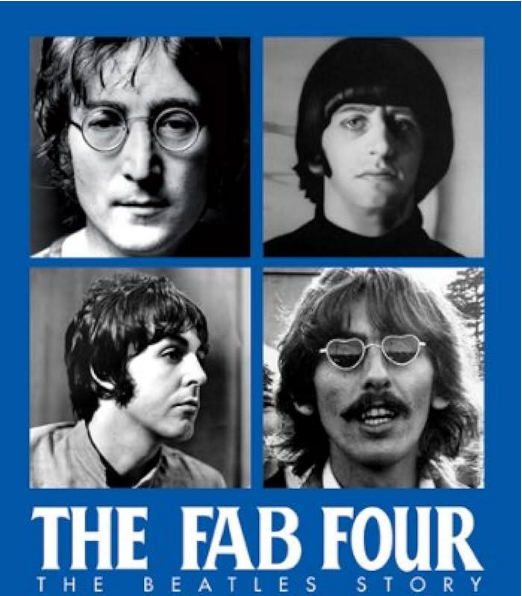
Alessandra Chinaglia

SCDO Cardiologia

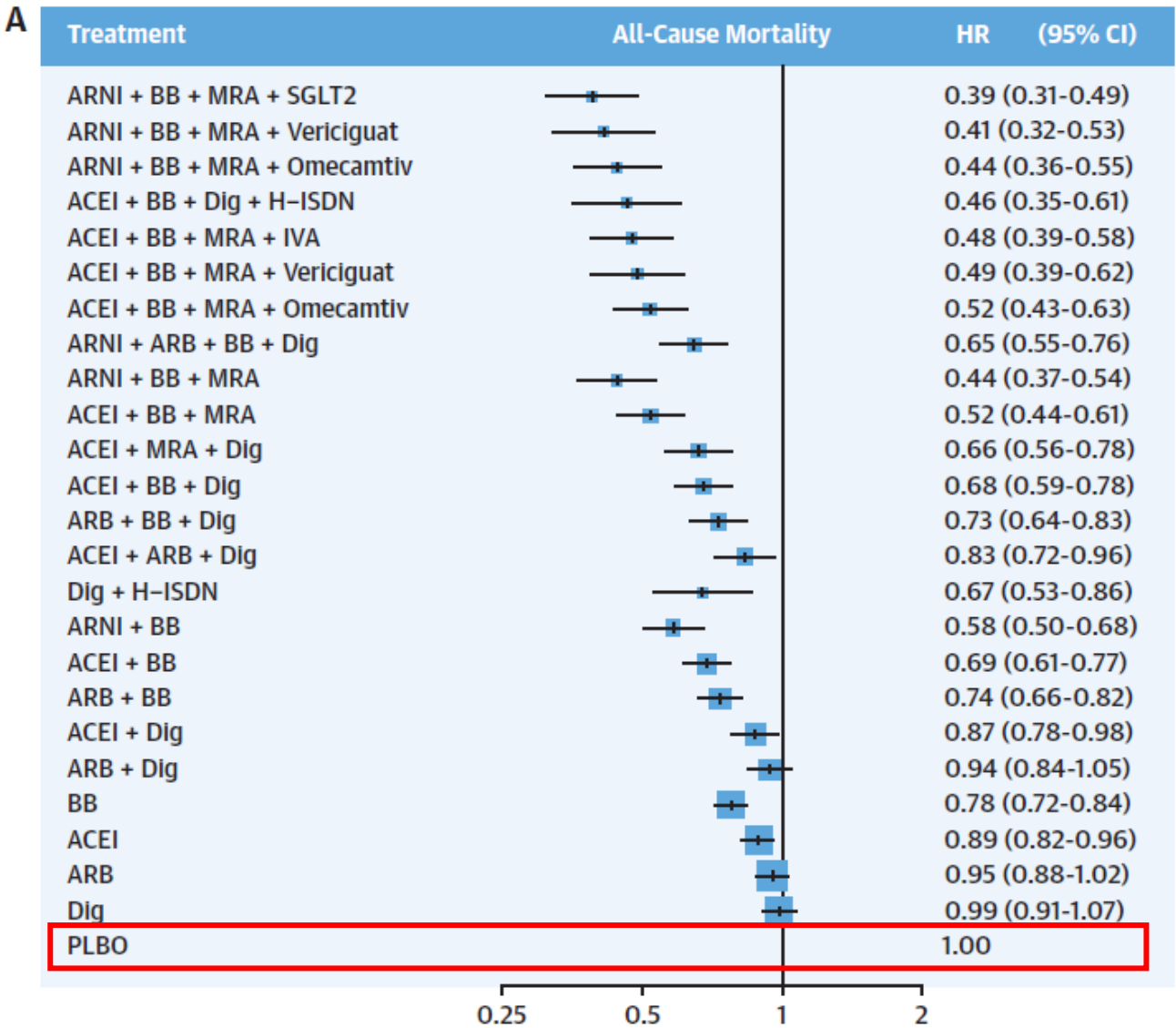
AOU San Luigi Gonzaga

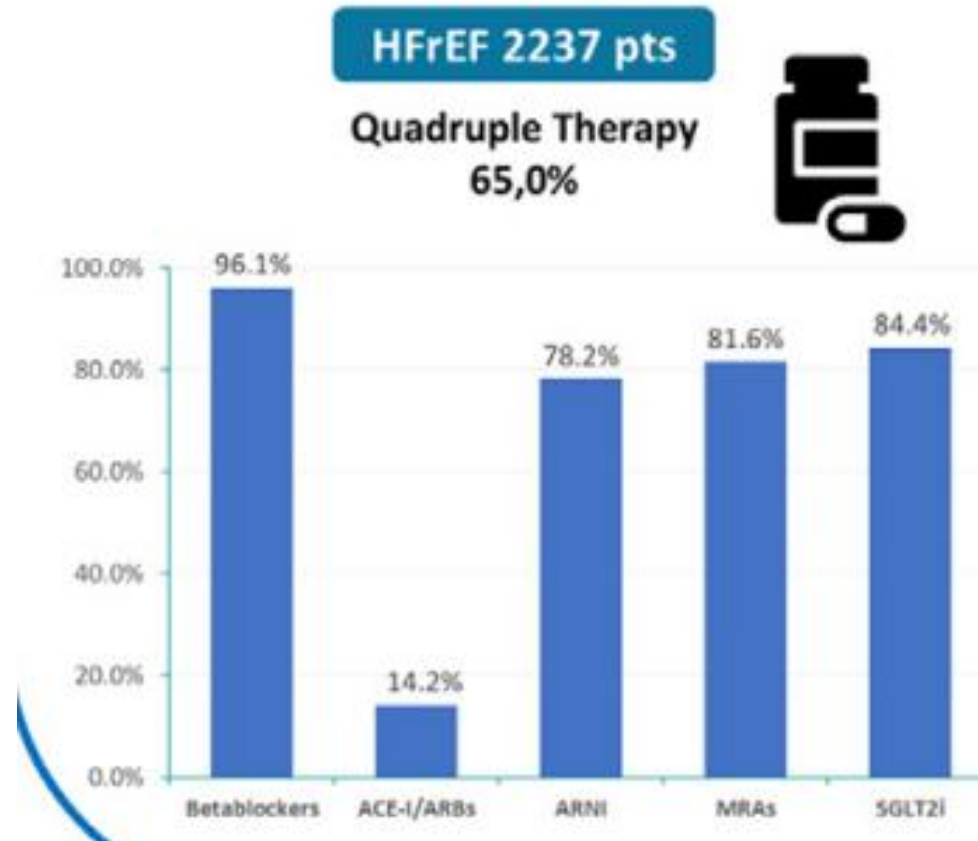
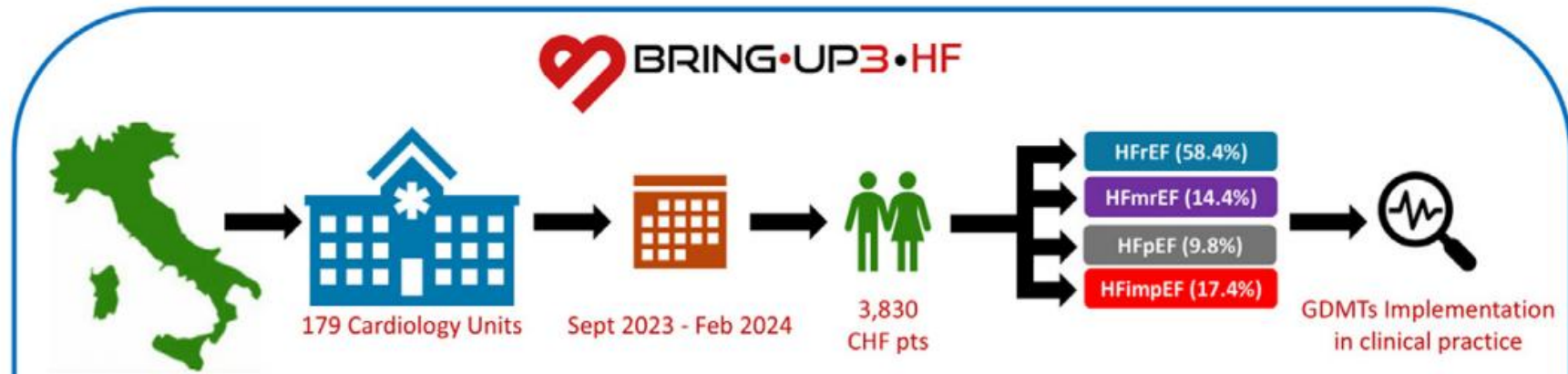


Terapia medica ottimale



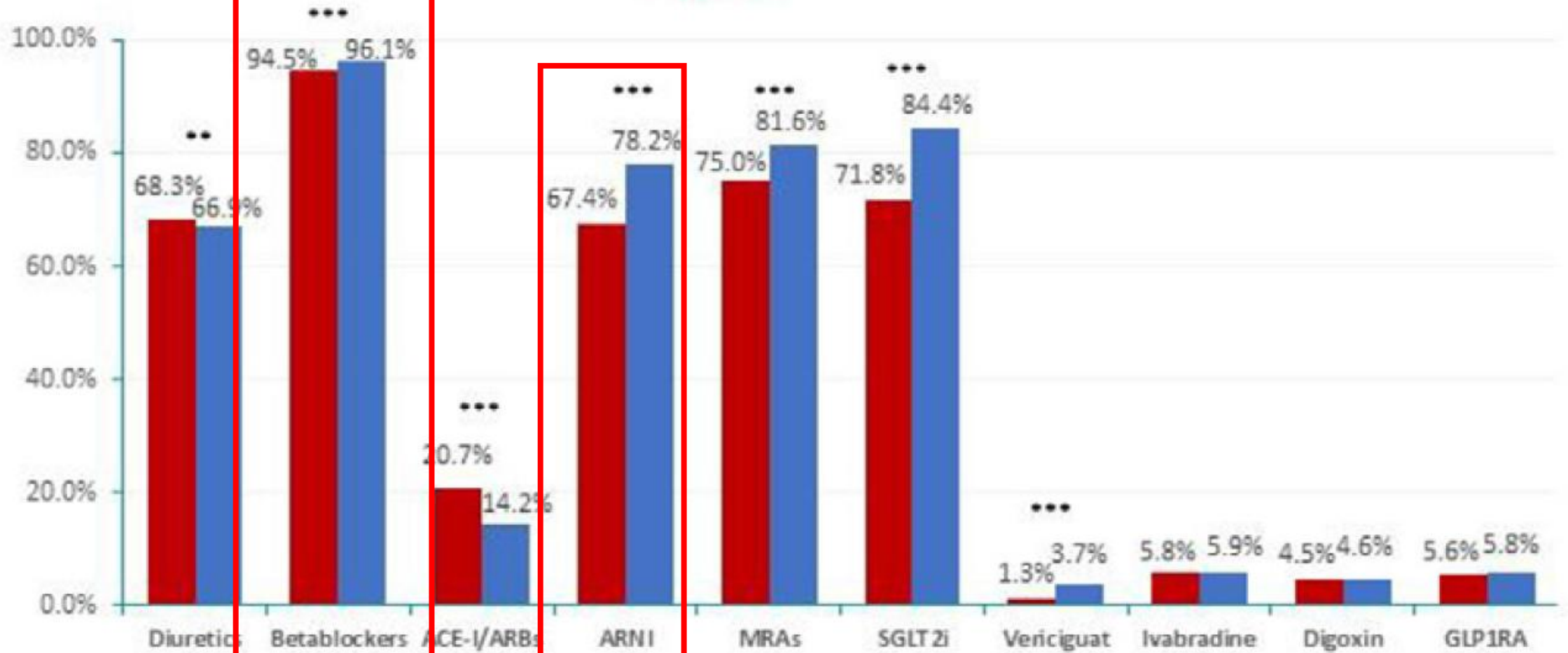
Trattamento dello scompenso a frazione di eiezione ridotta





■ *Pre-Visit* ■ *P*

Panel A. **HFrEF** (n. 2237)

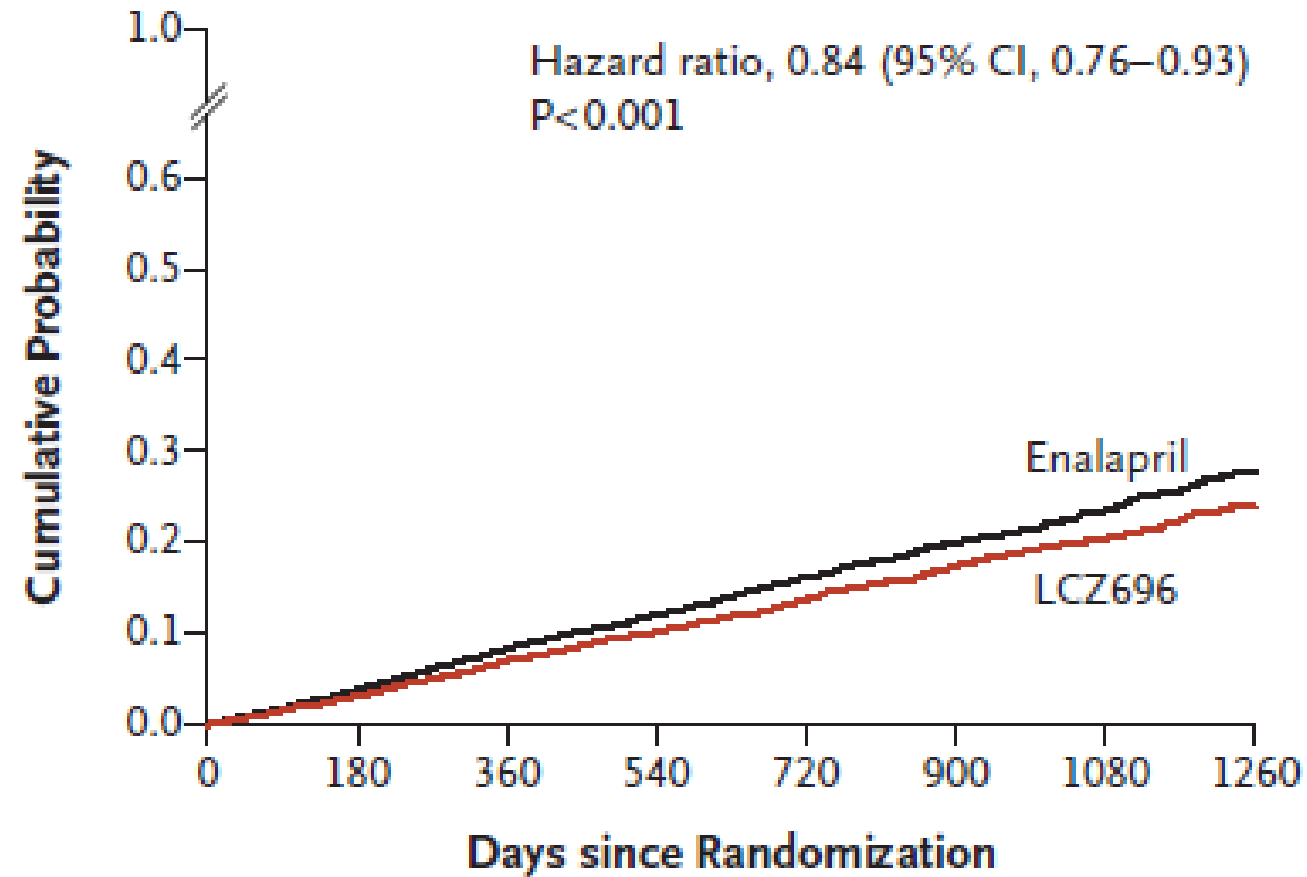


Angiotensin–Neprilysin Inhibition versus Enalapril in Heart Failure

PARADIGM- HF

Mortalità

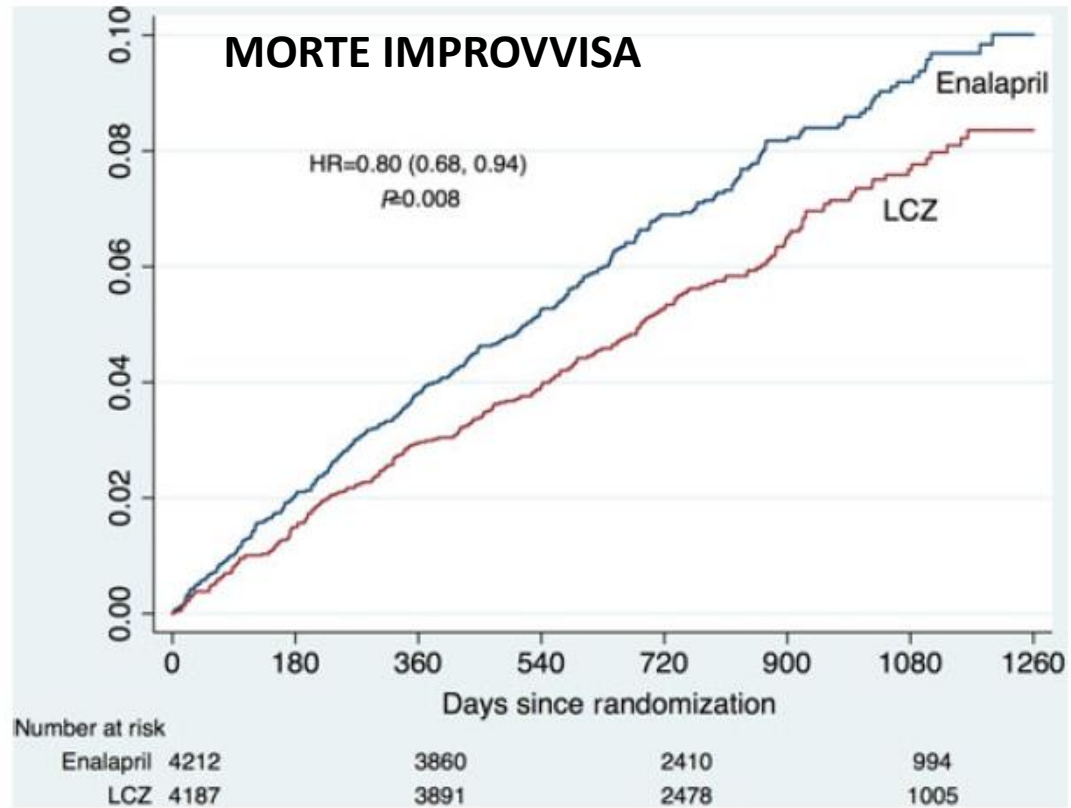
D Death from Any Cause



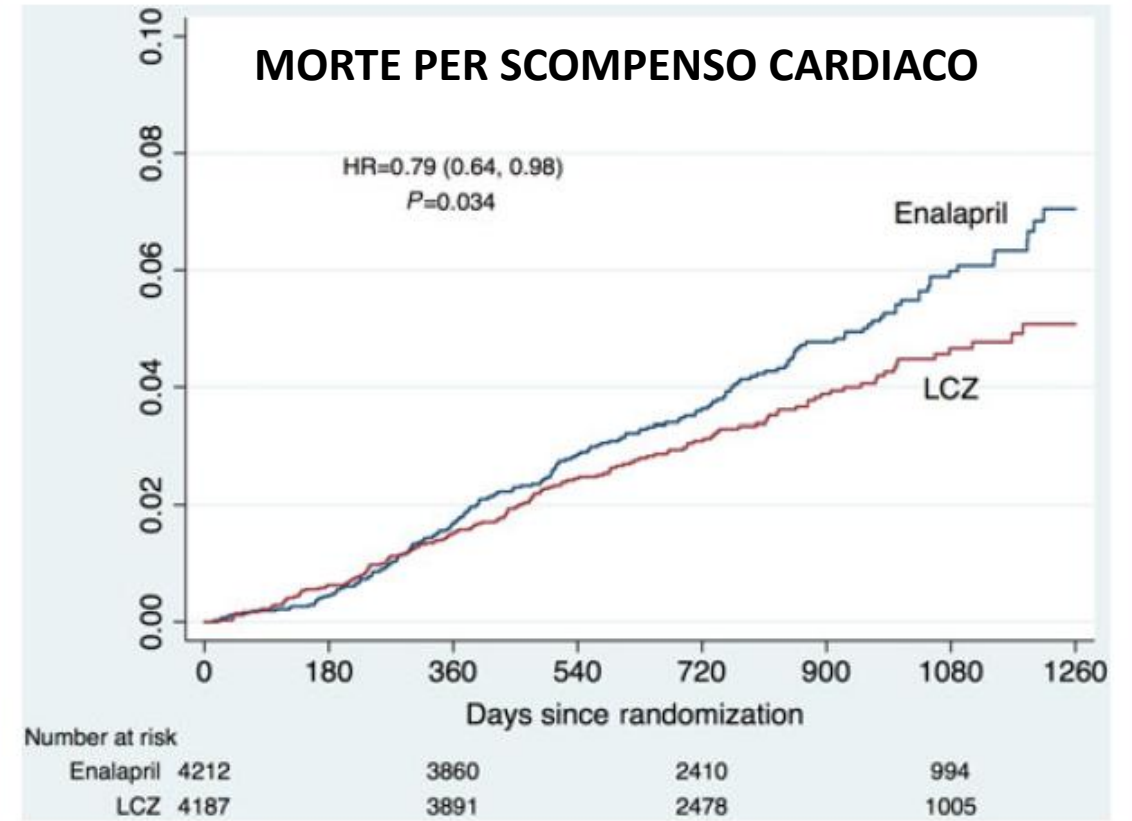
8442 patients
class II, III, IV
FE 29%

Effect of the angiotensin-receptor-neprilysin inhibitor **LCZ696** compared with enalapril on mode of death in heart failure patients

Effetti collaterali: ipotensione, insufficienza renale e iperpotassiemia



36%

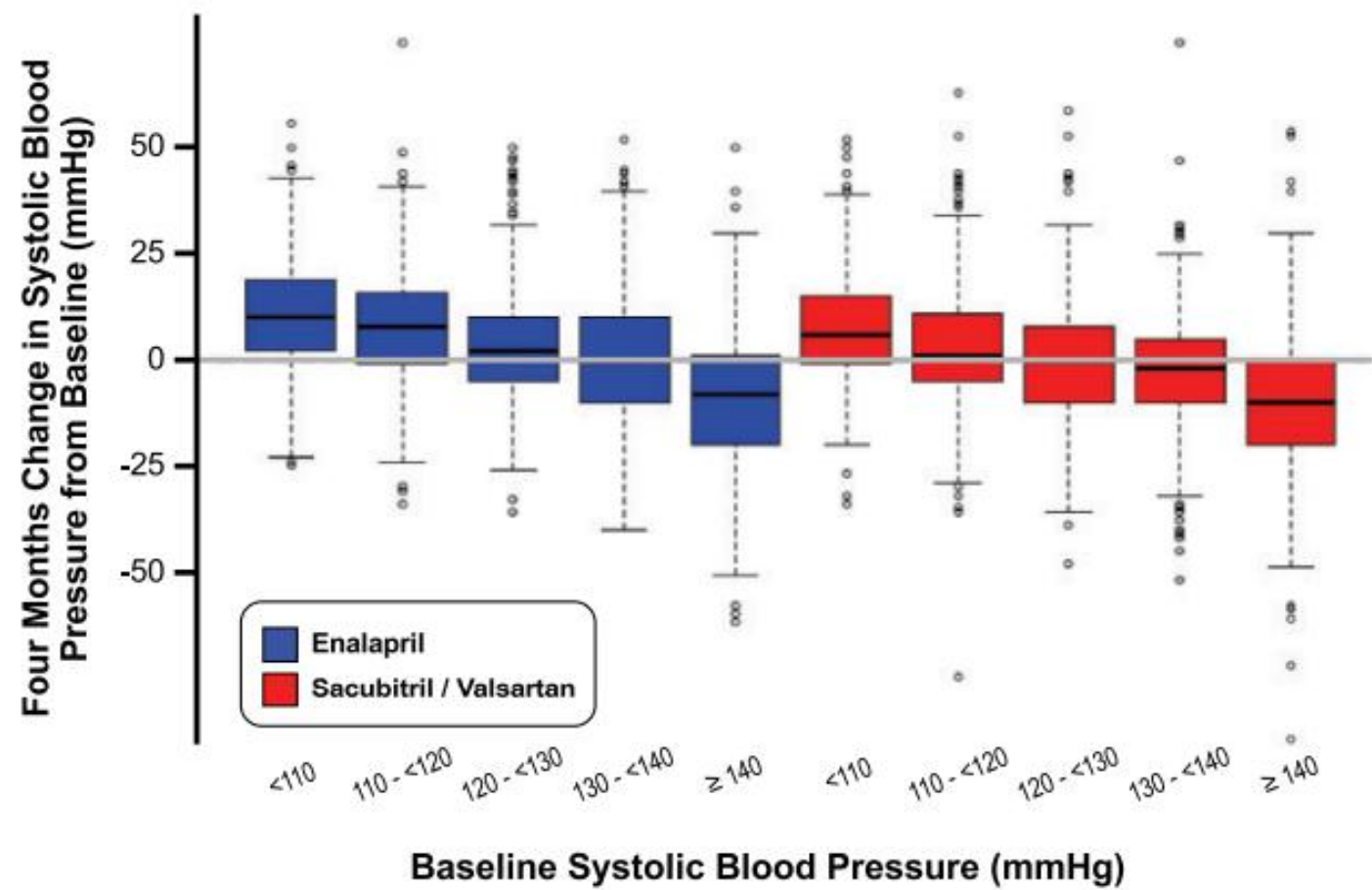


21%

European Heart Journal (2015) 36, 1990–1997

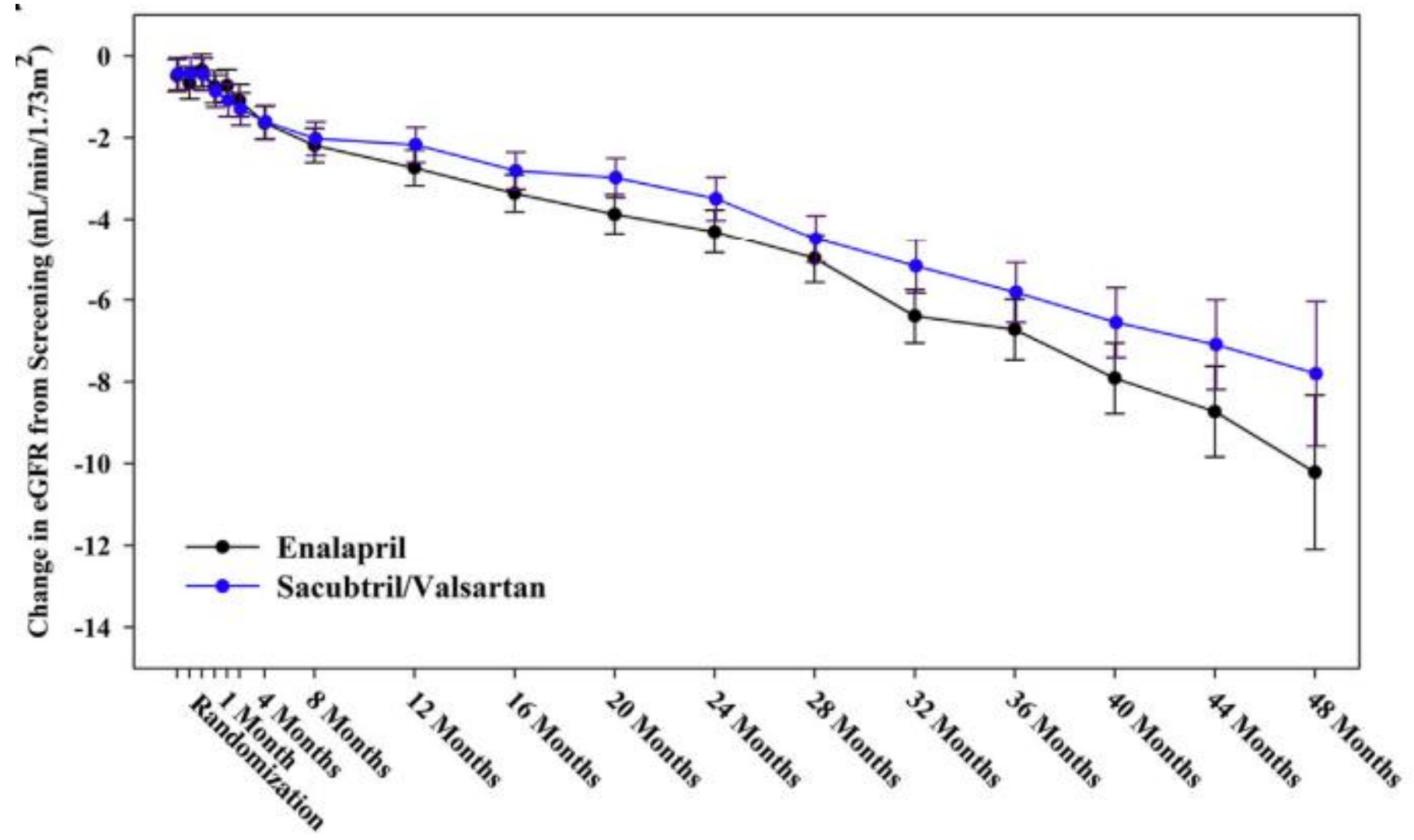
Systolic blood pressure, cardiovascular outcomes and efficacy and safety of sacubitril/valsartan (LCZ696) in patients with chronic heart failure and reduced ejection fraction: results from PARADIGM-HF

Ipotensione



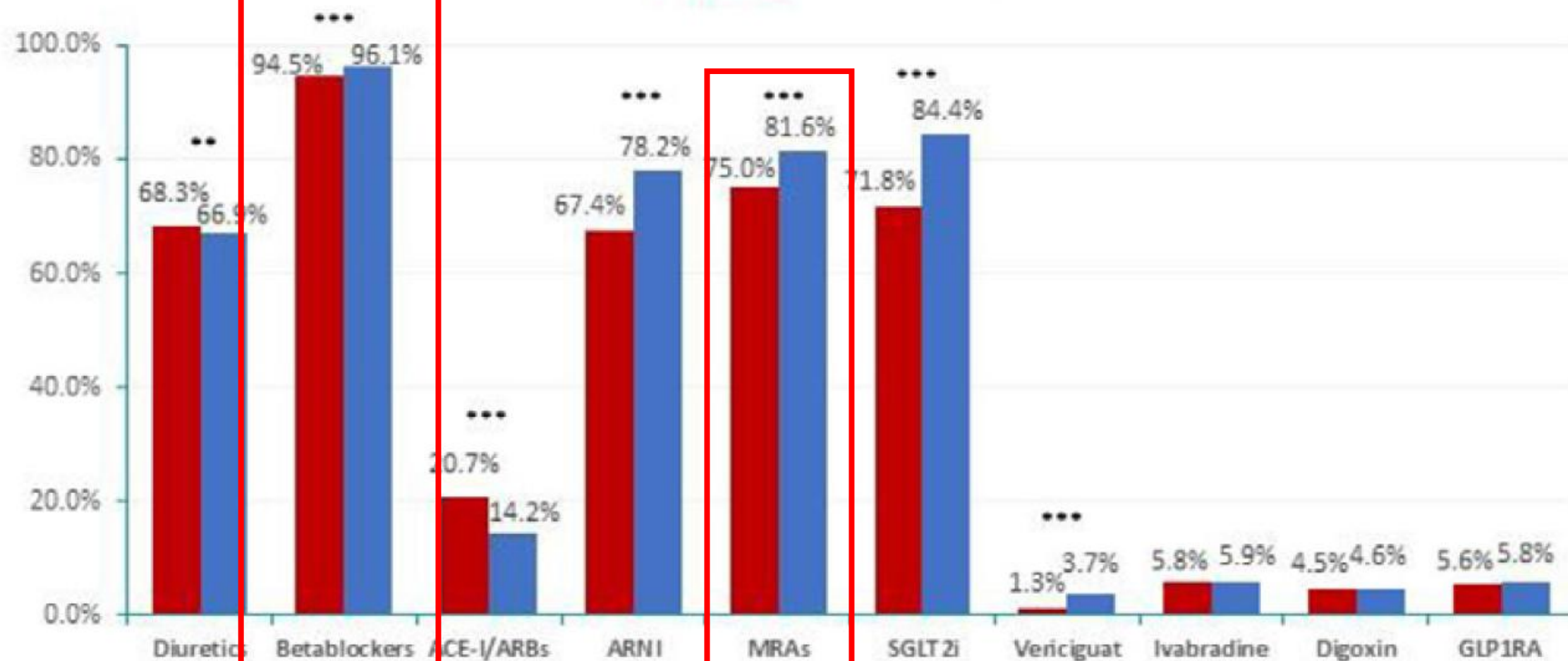
Renal Effects and Associated Outcomes
During Angiotensin-Neprilysin Inhibition
in Heart Failure

Insufficienza renale

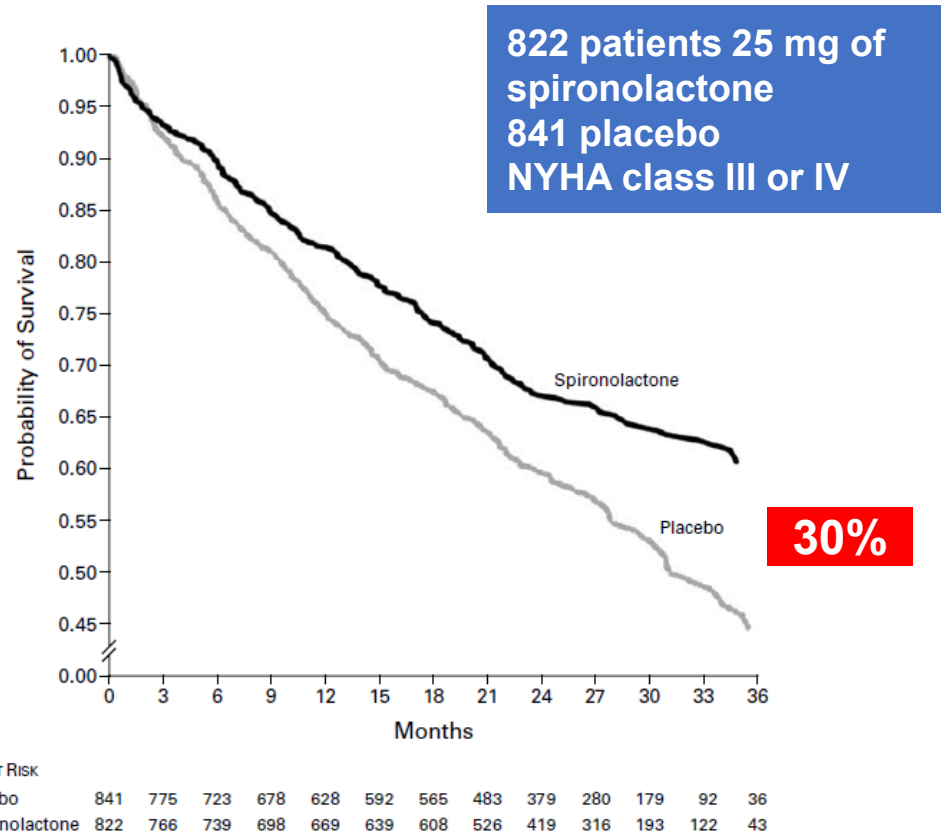


■ *Pre-Visit* ■ *P*

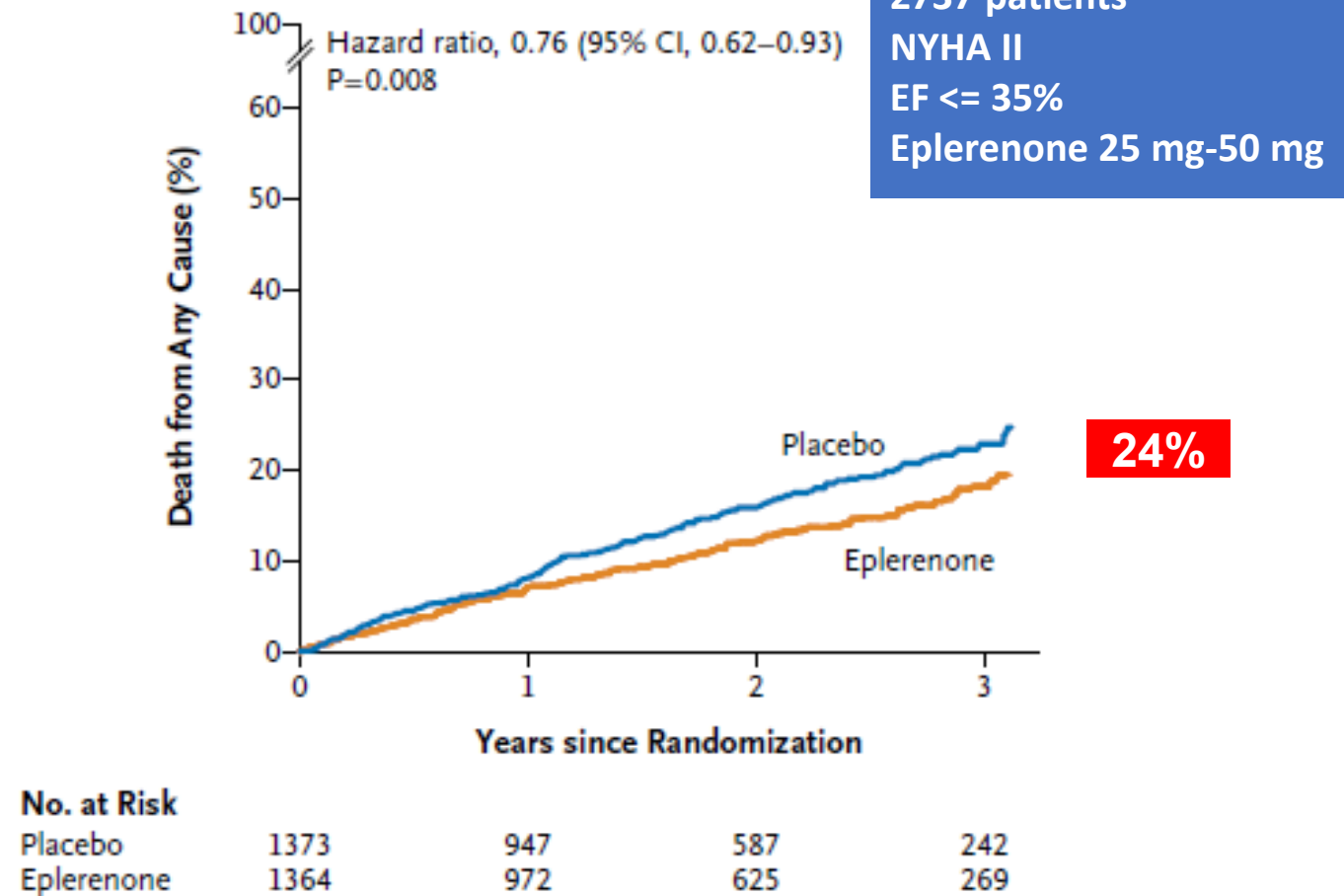
Panel A. **HFrEF** (n. 2237)



Effetti collaterali: iperpotassiemia

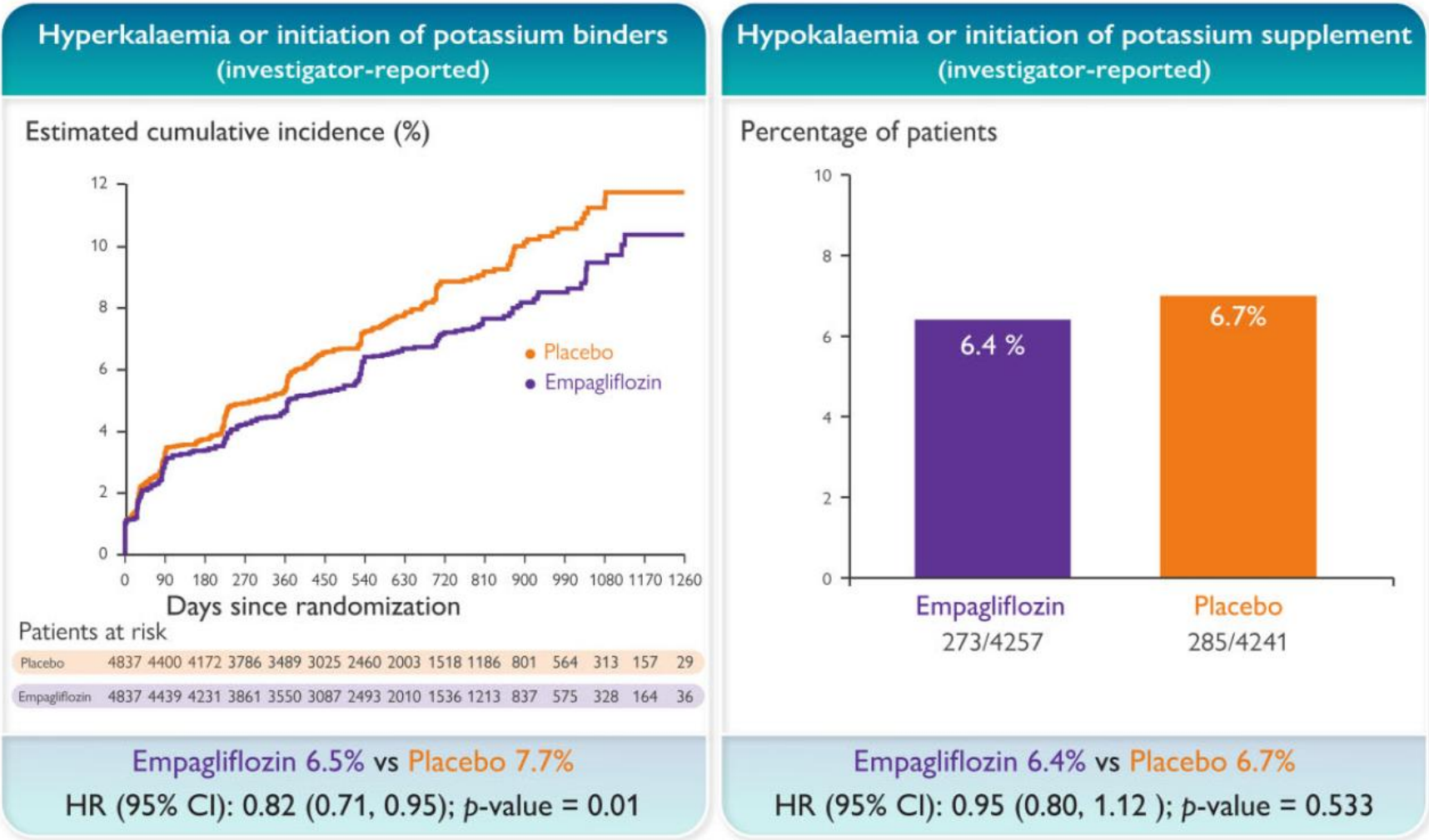


B



Empagliflozin and serum potassium in heart failure: an analysis from EMPEROR-Pooled

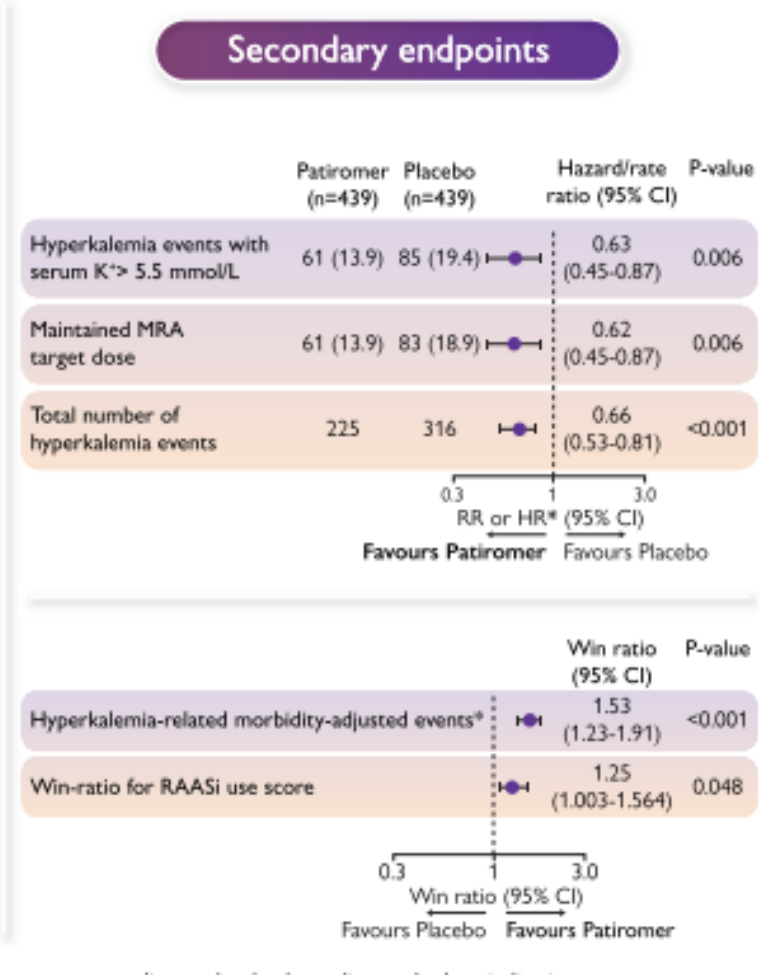
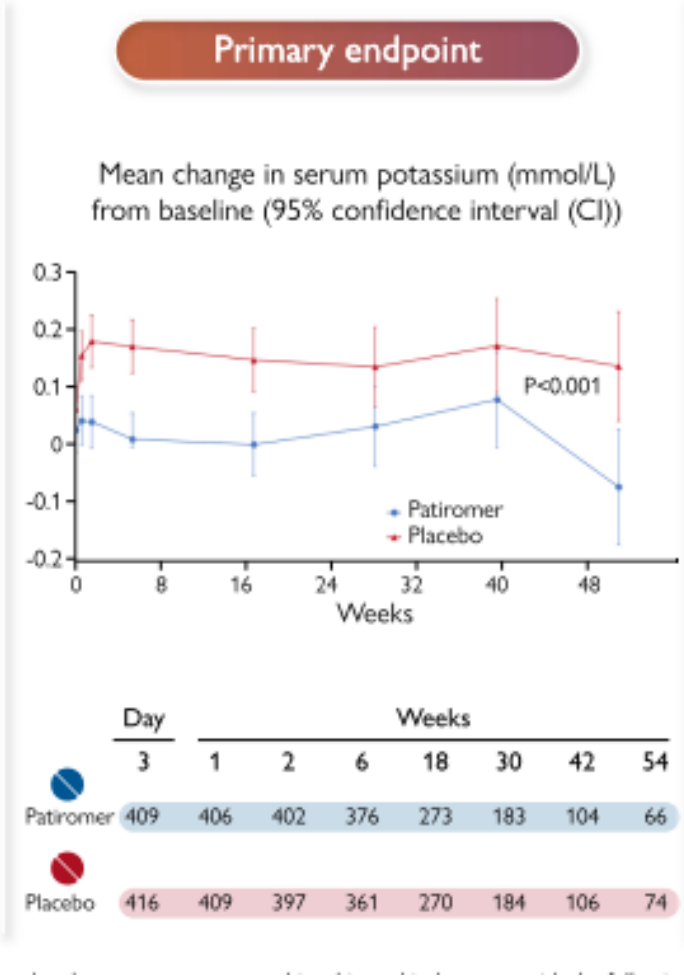
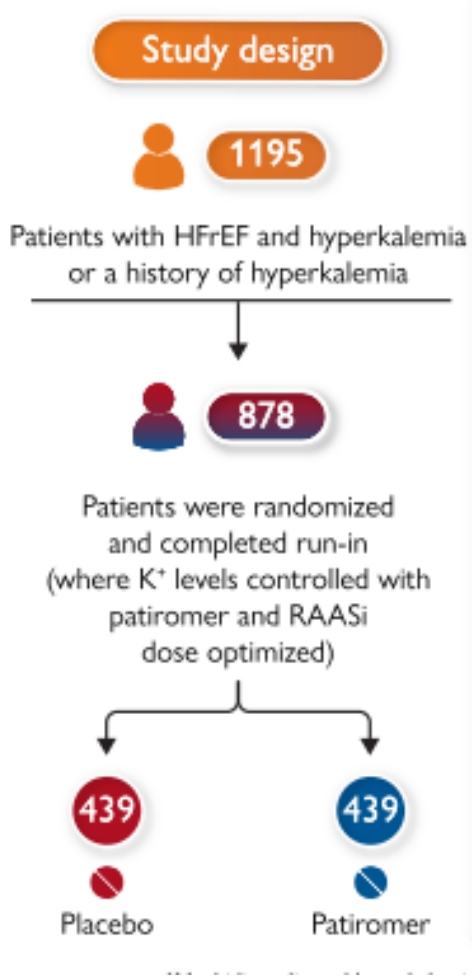
EMPEROR-Pooled (EMPEROR-Reduced and EMPEROR-Preserved combined) included 9583 patients



Patiromer for the management of hyperkalemia in heart failure with reduced ejection fraction: the DIAMOND trial

DIAMOND

Patiromer use in patients with heart failure and reduced ejection fraction (HFrEF) with hyperkalemia (HK)



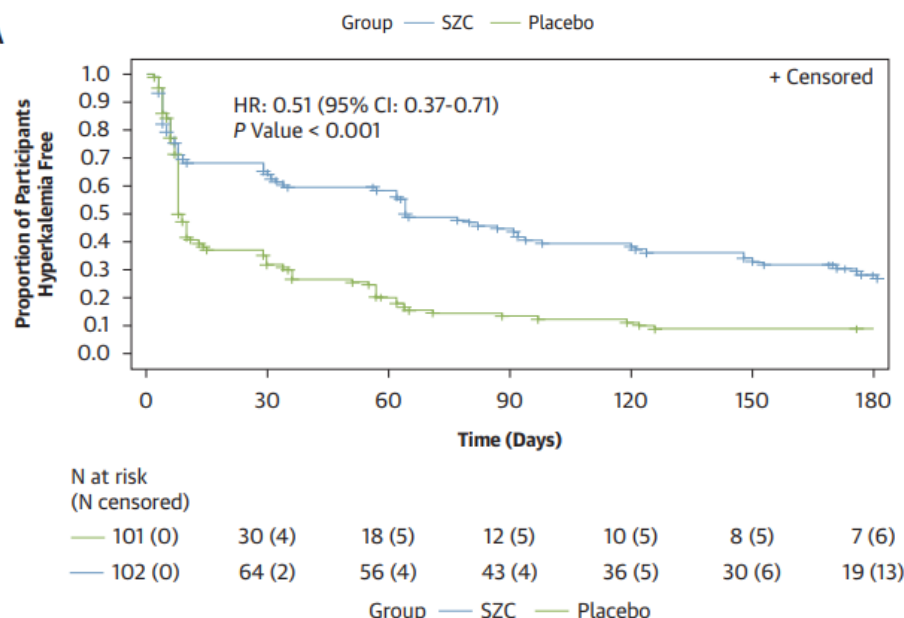
Sodium Zirconium Cyclosilicate for Management of Hyperkalemia During Spironolactone Optimization in Patients With Heart Failure

REALIZE-K

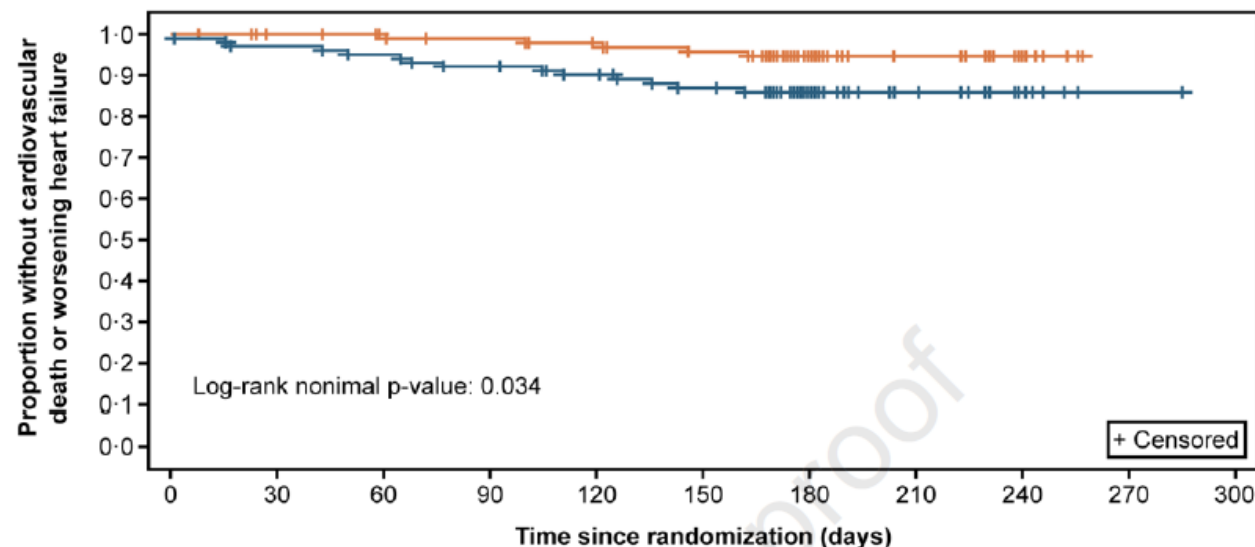
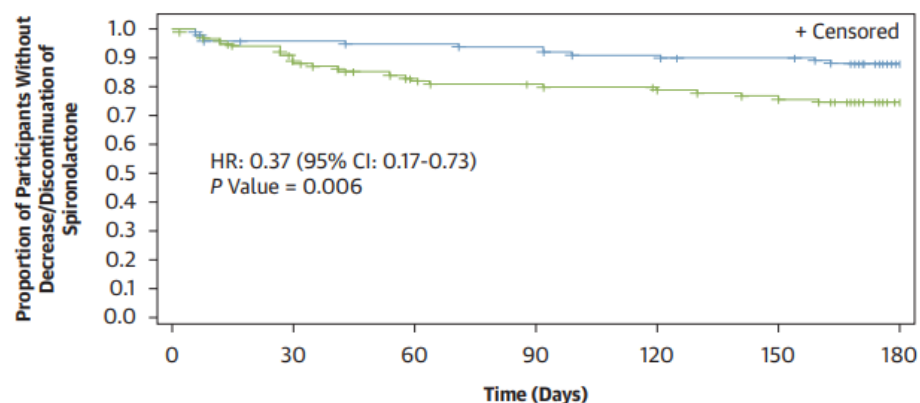


Time to first A) hyperkalemia and B) spironolactone decrease/discontinuation due to hyperkalemia

A



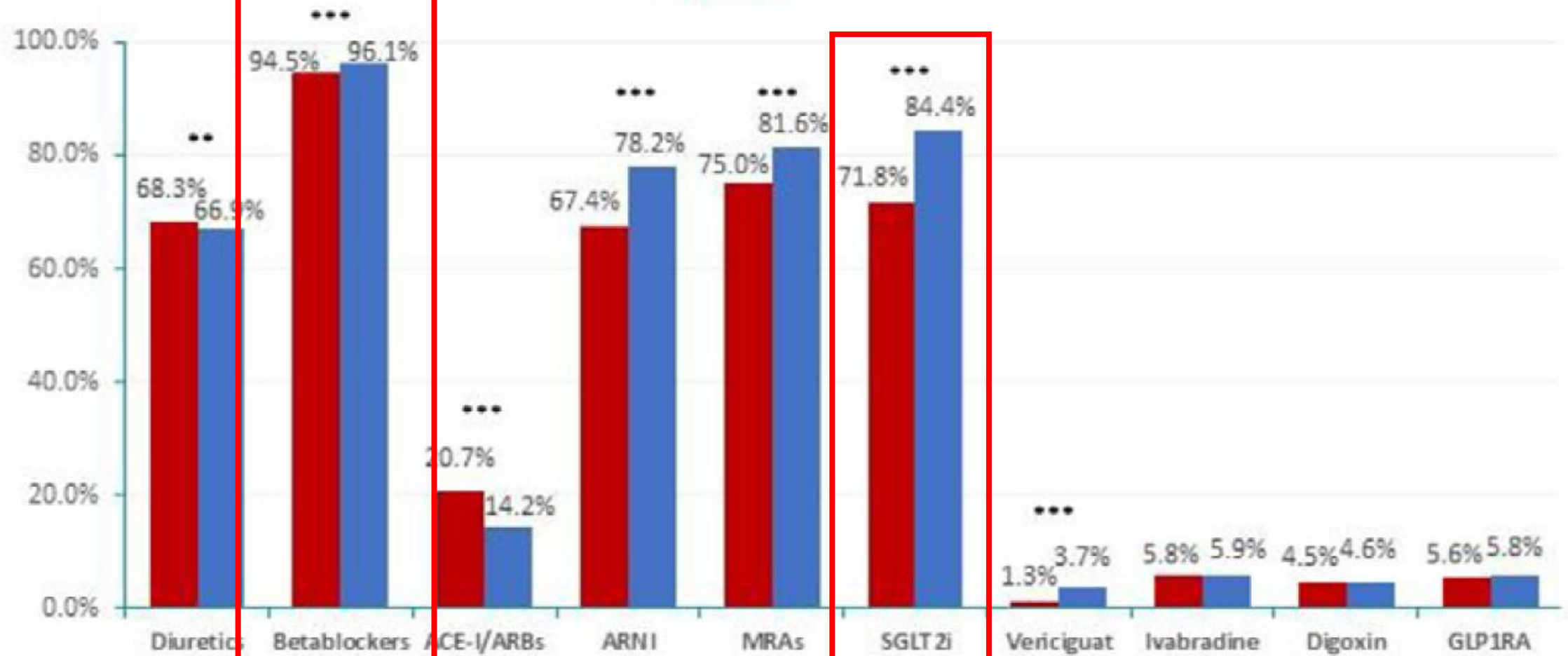
B



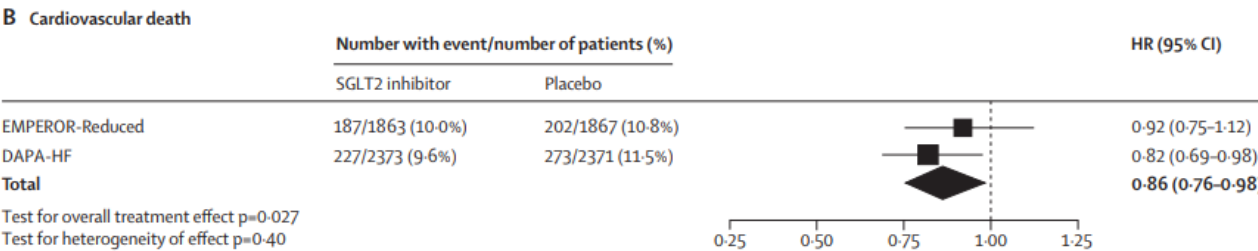
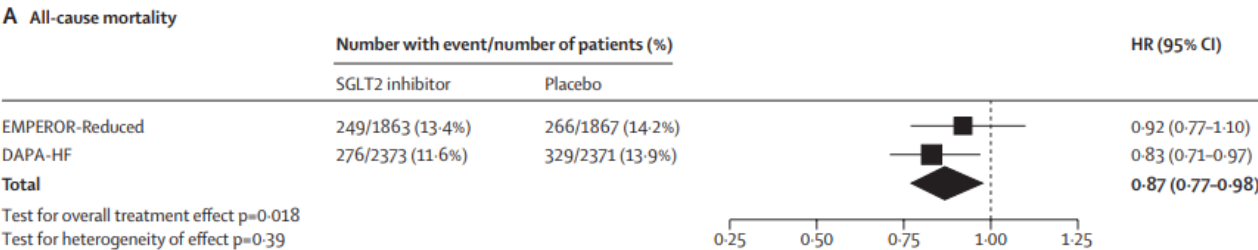
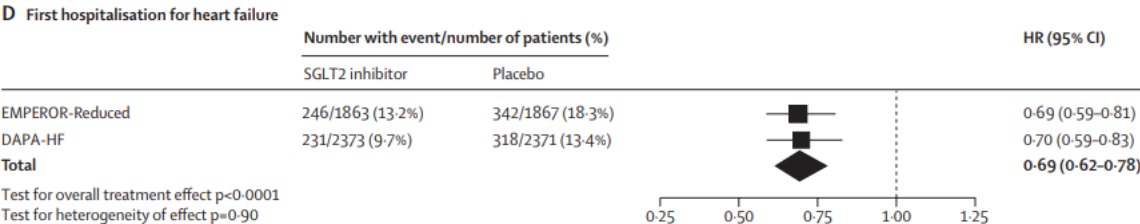
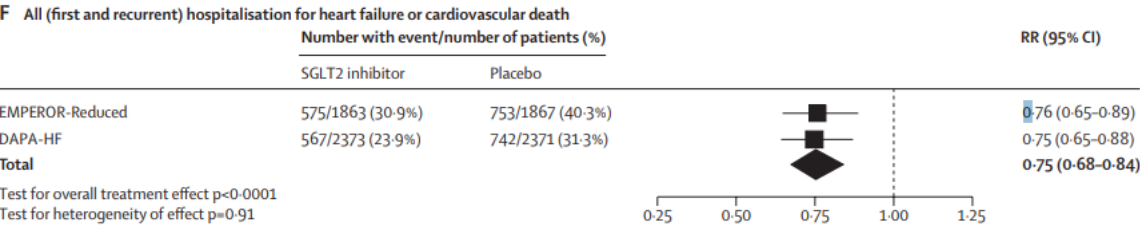
	Group — SZC — Placebo										
Placebo	101 (0)	97 (4)	94 (7)	92 (8)	89 (10)	87 (11)	45 (53)	16 (82)	6 (92)	0 (98)	0 (98)
SZC	102 (0)	98 (2)	96 (2)	93 (2)	90 (4)	86 (6)	43 (48)	18 (73)	8 (83)	1 (90)	0 (91)

■ *Pre-Visit* ■ *P*

Panel A. **HFrEF** (n. 2237)



SGLT2 inhibitors in patients with heart failure with reduced ejection fraction: a meta-analysis of the EMPEROR-Reduced and DAPA-HF trials



Main clinical concerns in initiating SGLT2i



Starting in the acute setting

- **EMPULSE (11)**: win ratio of clinical benefit^a favours SGLT2i
- **EMPA-RESPONSE-AHF (10)** : composite endpoint favours SGLT2i^b
- **DICTATE-AHF (12)**: evidence for enhanced diuresis^c

NO difference in AEs between SGLT2i and placebo

Risk of volume depletion



- **DICTATE-AHF (12)**: no $\neq$ in weight-based diuretic efficiency
- **EMPAG-HF (14)** (25 mg): 25% $\uparrow$ UO, no effect on eGFR slope nor on AEs
- **DELIVER (3)**: 32% $\downarrow$ new initiation of loop diuretics
- **EMPEROR-preserved (4)**: $\downarrow$ diuretic initiation or dose escalation, $\uparrow$ de-escalation / discontinuation



Hyperkalemia

EMPEROR-pooled (15): significant $\downarrow$ incidence of hyperkalemia, no $\uparrow$ of hypokalemia

SGLT2i mitigates the occurrence of hyperkalaemia & may maximize long-term tolerance of the quadruple therapy regimen (GDMT)

Deterioration of renal function



Mean $\neq$ in eGFR change:

- **EMPEROR-reduced (1)**: -2.5 mL/min/1.73m²; no $\neq$ risk of CV and renal outcomes if early eGFR $\downarrow$
- **DAPA-HF (2)**: -3.1 mL/min/1.73m²; similar early $\downarrow$ in eGFR after initiation across the range of eGFR

If eGFR fall below initiation thresholds: $\uparrow$ CV outcomes risk. SGLT2i still beneficial on CV outcomes, w/out $\uparrow$ in safety outcomes

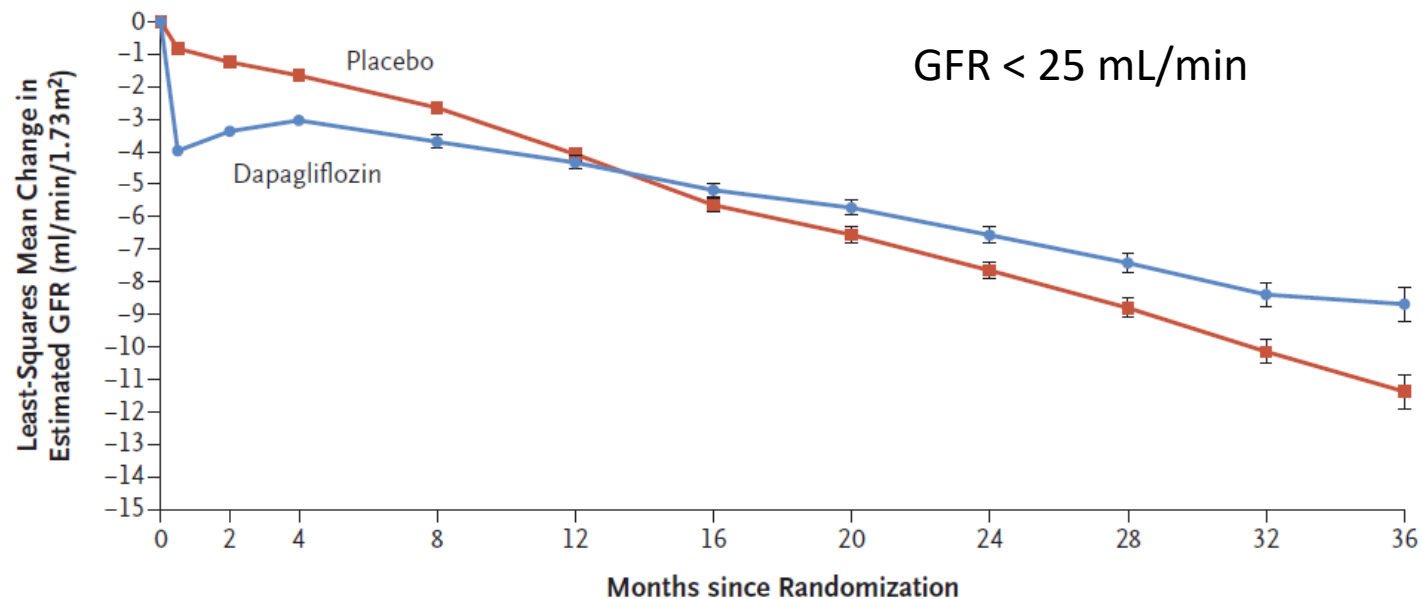
DAPA CKD

Dapagliflozin in Patients with Chronic Kidney Disease

4304 participants

eGFR 25 - 75 ml/min/1.73 m₂

Urinary albumin-to-creatinine ratio 200 - 5000



EMPEROR-R

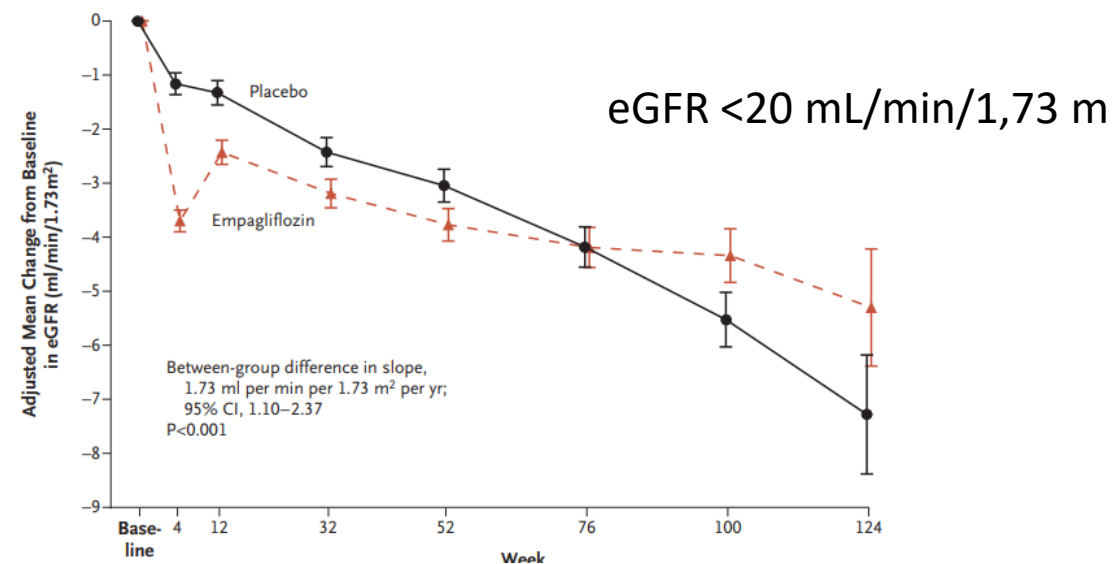
Cardiovascular and Renal Outcomes with Empagliflozin in Heart Failure

3730 patients

NYHA II, III, IV

EF ≤ 40%

Diabetes 49.8%

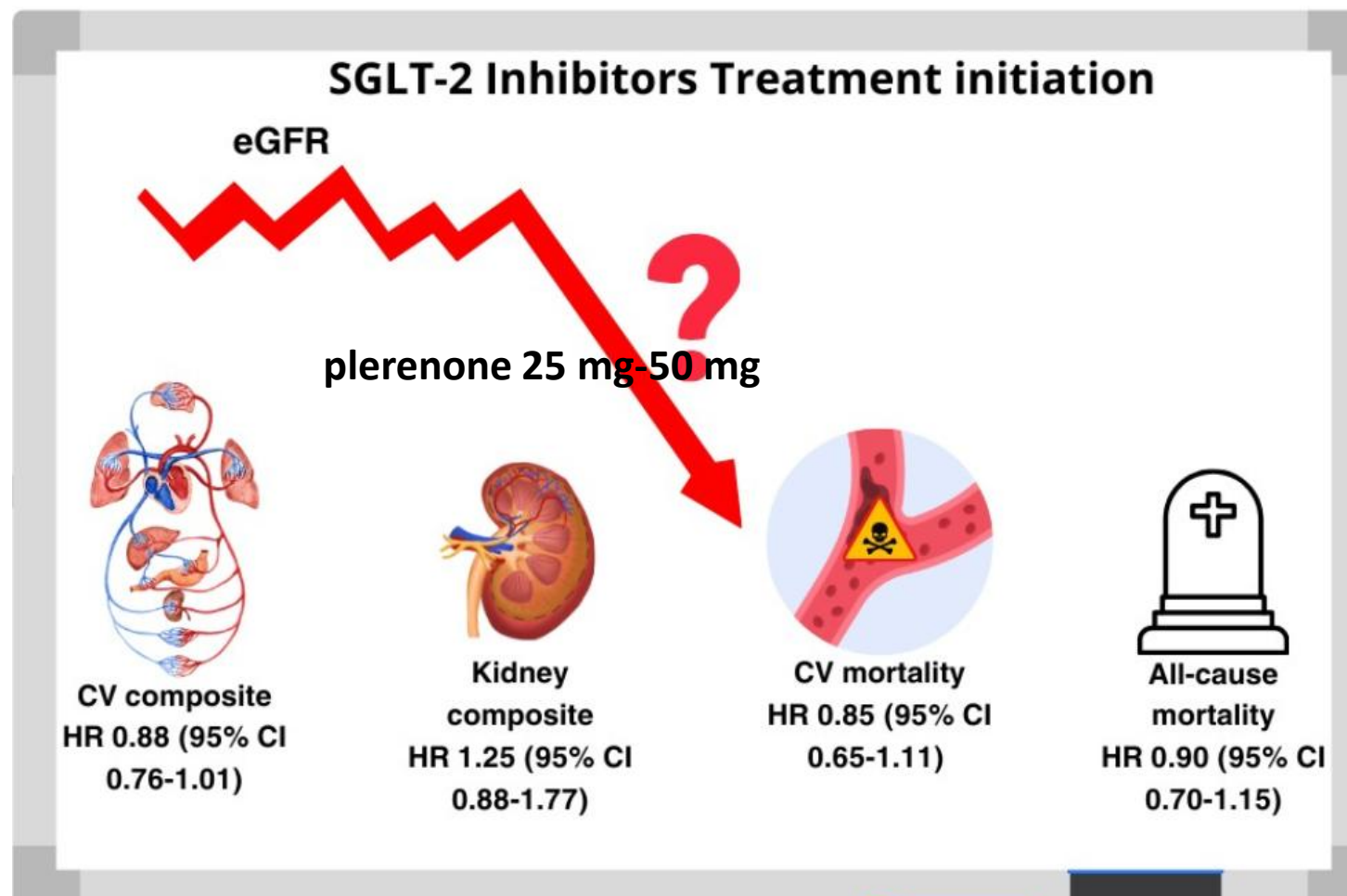




A placebo-corrected effect of the initial eGFR decline following SGLT-2 inhibitor initiation: a systematic review and meta-analysis

5 papers

23890 patients, the dip occurring in 13575 (56.82%)
8245(34.51%) in the intervention arm
5330 (22.31%) in the placebo arm



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Deterioration of renal function

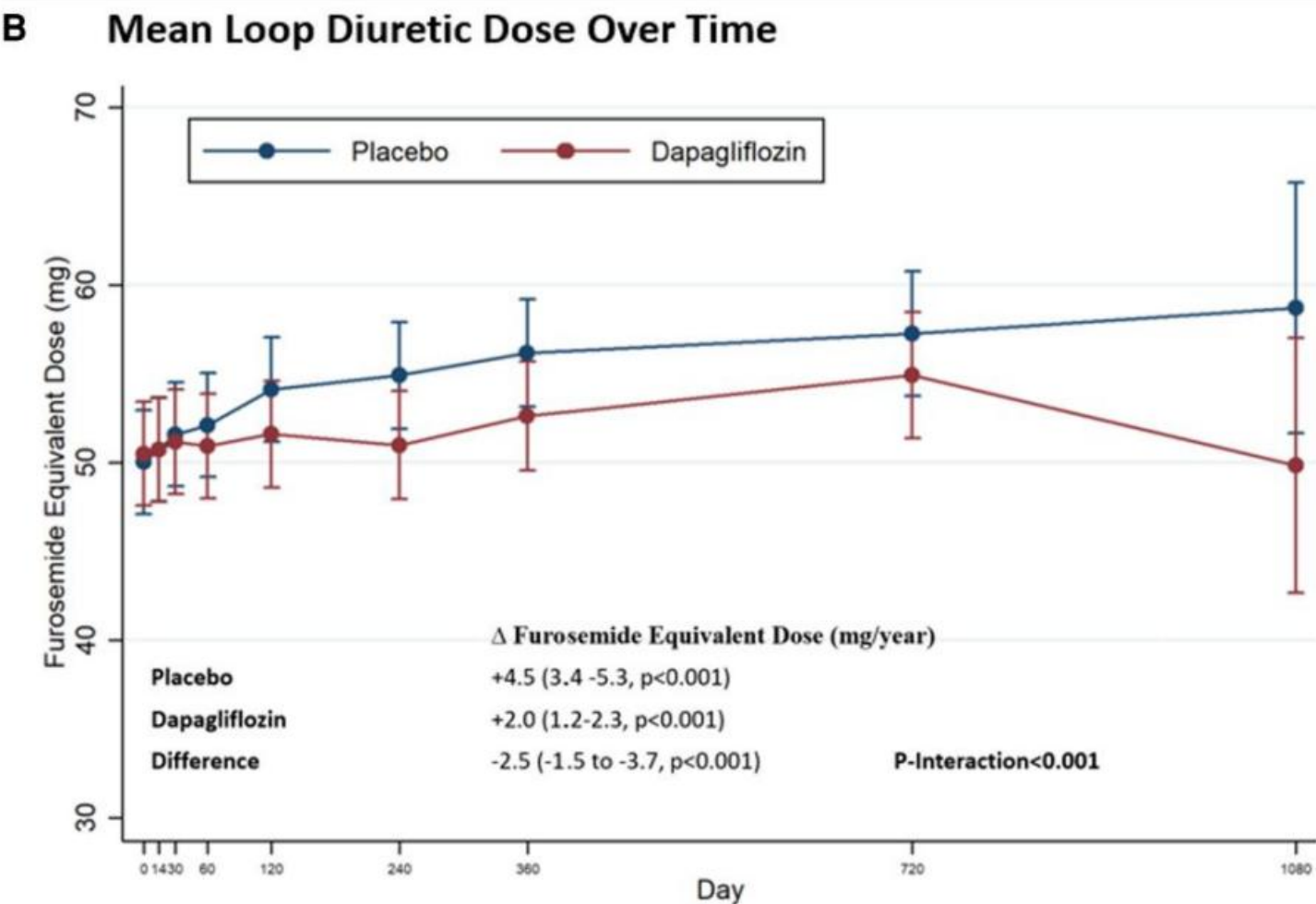


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If eGFR fall below initiation thresholds: $\uparrow$ CV outcomes risk. SGLT2i still beneficial on CV outcomes, w/out $\uparrow$ in safety outcomes

Dapagliflozin and diuretic utilization in heart failure with mildly reduced or preserved ejection fraction: the DELIVER trial



Main clinical concerns in initiating SGLT2i



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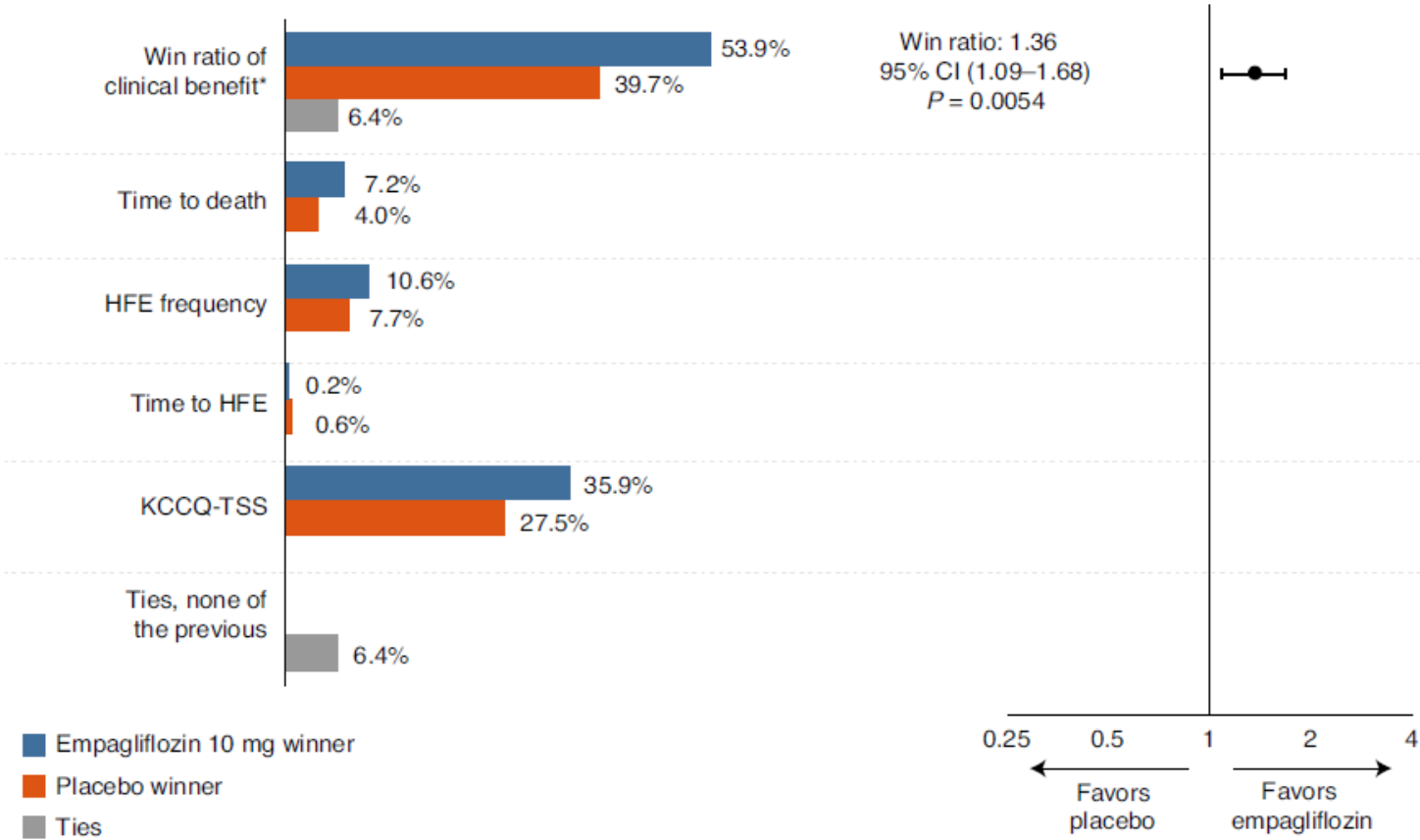
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The SGLT2 inhibitor empagliflozin in patients hospitalized for acute heart failure: a multinational randomized trial

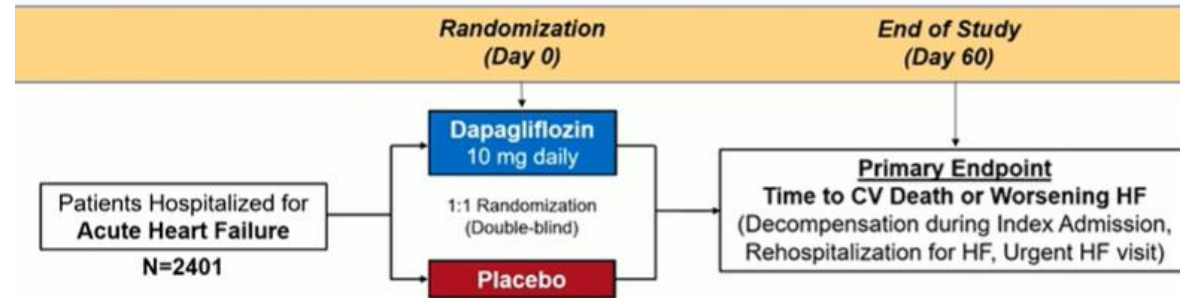
clinical benefit: composite of death from any cause, number of HF events, and time to first HF event, or a ≥ 5 point difference in change from baseline in the KCCQ total symptom score at 90 days,



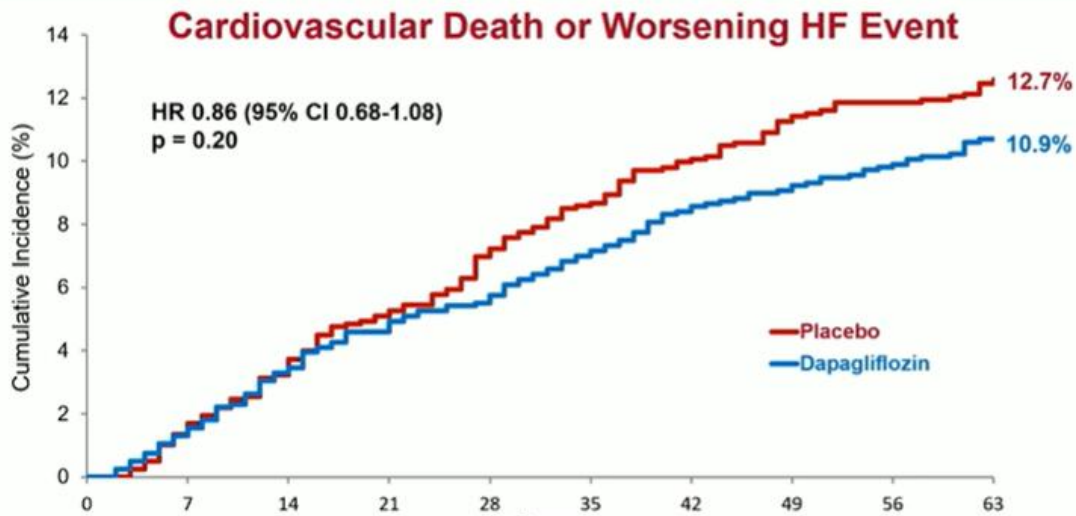
DAPA ACT HF – TIMI 68

Dapagliflozin in Patients Hospitalized for Heart Failure

David D. Berg, MD, MPH
for the DAPA ACT HF – TIMI 68 Investigators



Primary Endpoint



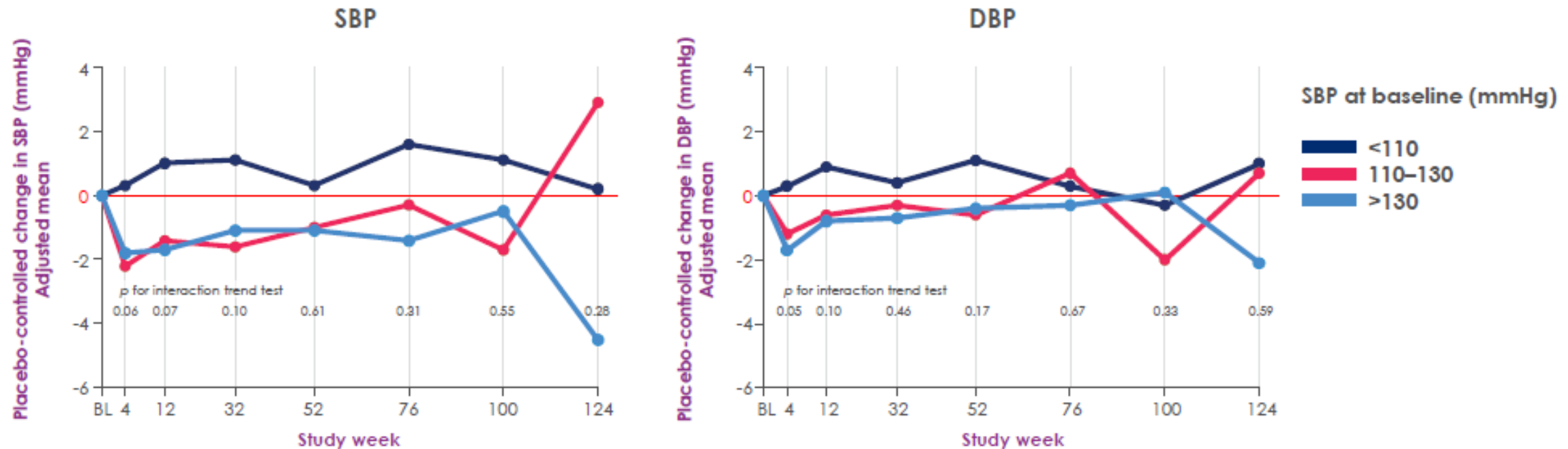
Safety Endpoints



	Dapagliflozin (N=1218)	Placebo (N=1183)
Symptomatic hypotension	43 (3.6%)	26 (2.2%)
Worsening kidney function	71 (5.9%)	55 (4.7%)
Major hypoglycemia	3 (0.2%)	3 (0.3%)
Diabetic ketoacidosis	0 (0.0%)	0 (0.0%)
AE leading to IP discontinuation	58 (4.8%)	56 (4.7%)

Empagliflozin Improves Cardiovascular and Renal Outcomes in Heart Failure Irrespective of Systolic Blood Pressure

Placebo-corrected change in blood pressure from baseline in patients treated with empagliflozin

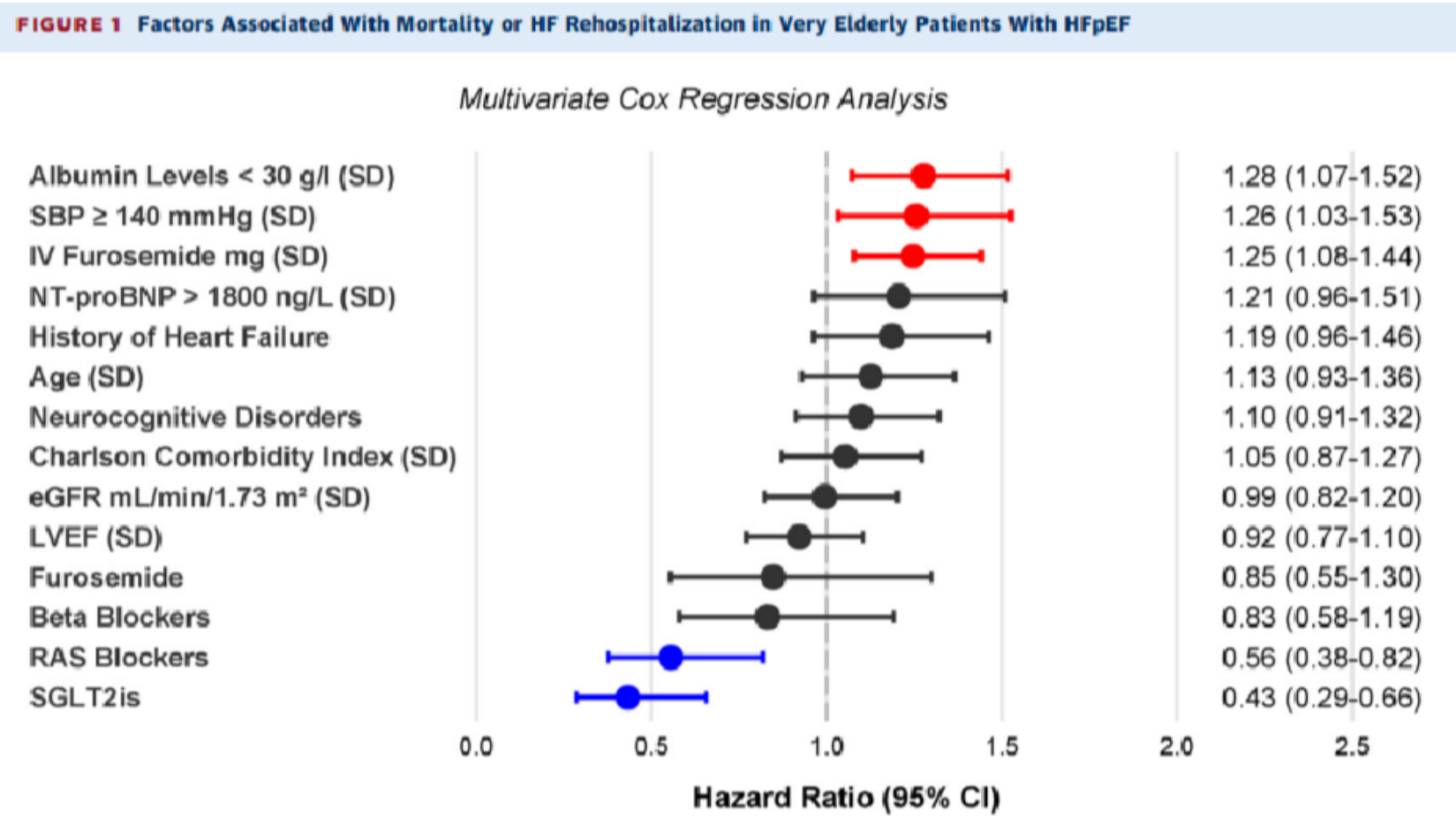


Between-group differences were of borderline significance after 4 and 12 weeks, but were not significant at later time points

Real-World Outcomes of SGLT2 Inhibitors in Very Elderly Patients With Heart Failure With Preserved Ejection Fraction

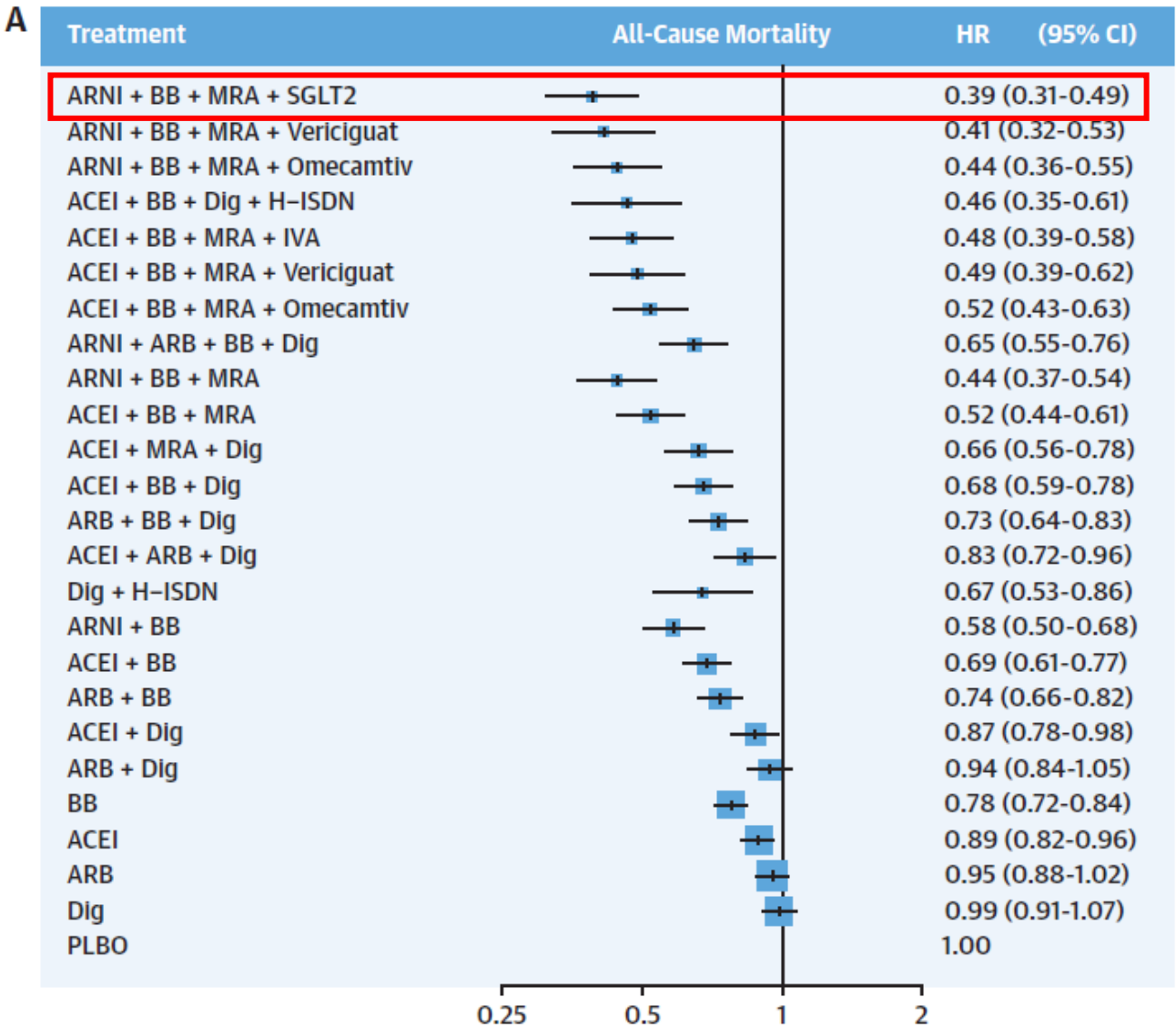
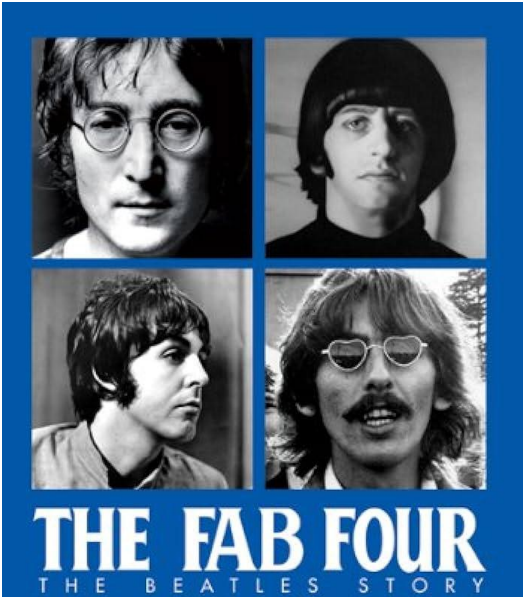
Patients >80 years admitted to 3 geriatric units in Paris
298 patients
mean age 90 years (59% >90 and 7% >100 years of age)

The 1-year mortality was 28.1% and the rate of HF rehospitalization was 22.8% .



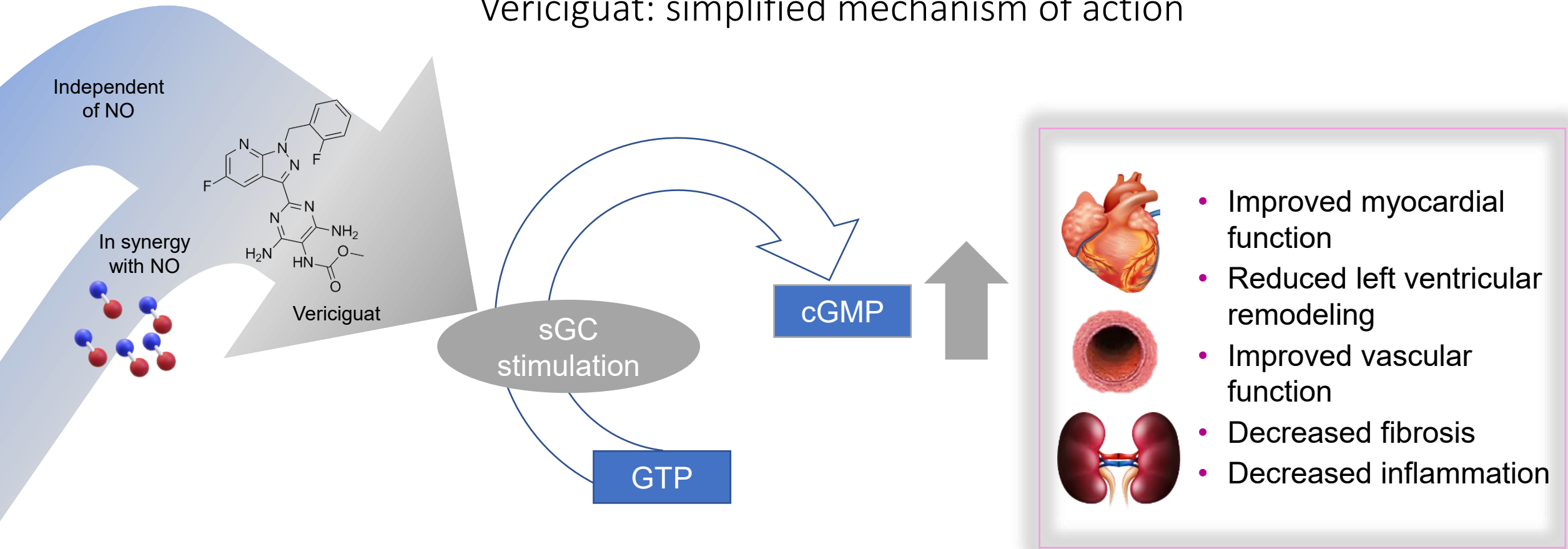
Terapia medica ottimale

Trattamento dello scompenso a frazione di eiezione ridotta



E oltre ???? Fab Five ???

Vericiguat: simplified mechanism of action

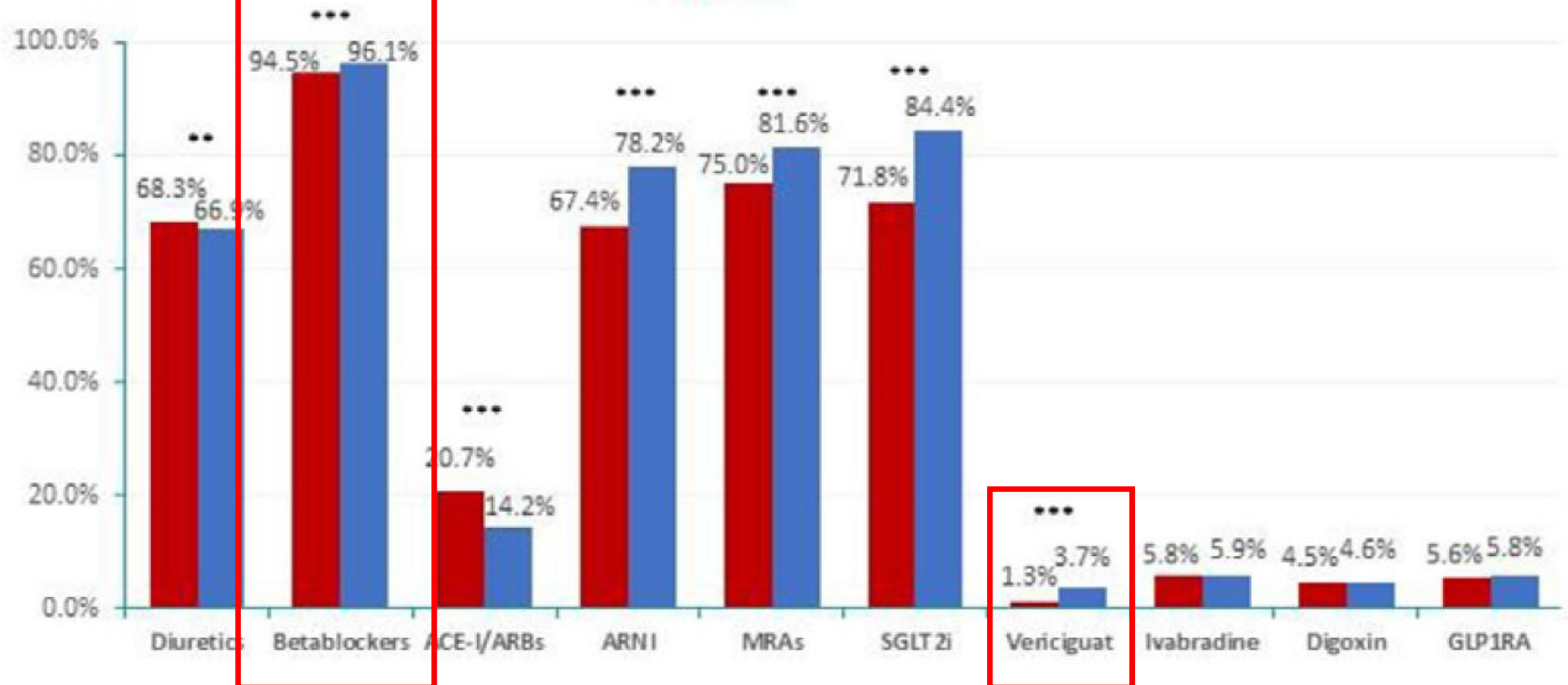


cGMP, cyclic guanosine monophosphate; GTP, guanosine triphosphate; NO, nitric oxide; sGC, soluble guanylate cyclase.

1. Armstrong PW et al. *JACC Heart Fail.* 2018;6:96–104; 2. Gheorghiade M et al. *Heart Fail Rev.* 2013;18:123–134; 3. Sandner P et al. *Handb Exp Pharmacol.* 2021;264:355–394.

■ *Pre-Visit* ■ *P*

Panel A. **HFrEF** (n. 2237)



Vericiguat in Patients with Heart Failure and Reduced Ejection Fraction

VICTORIA

5050 patients

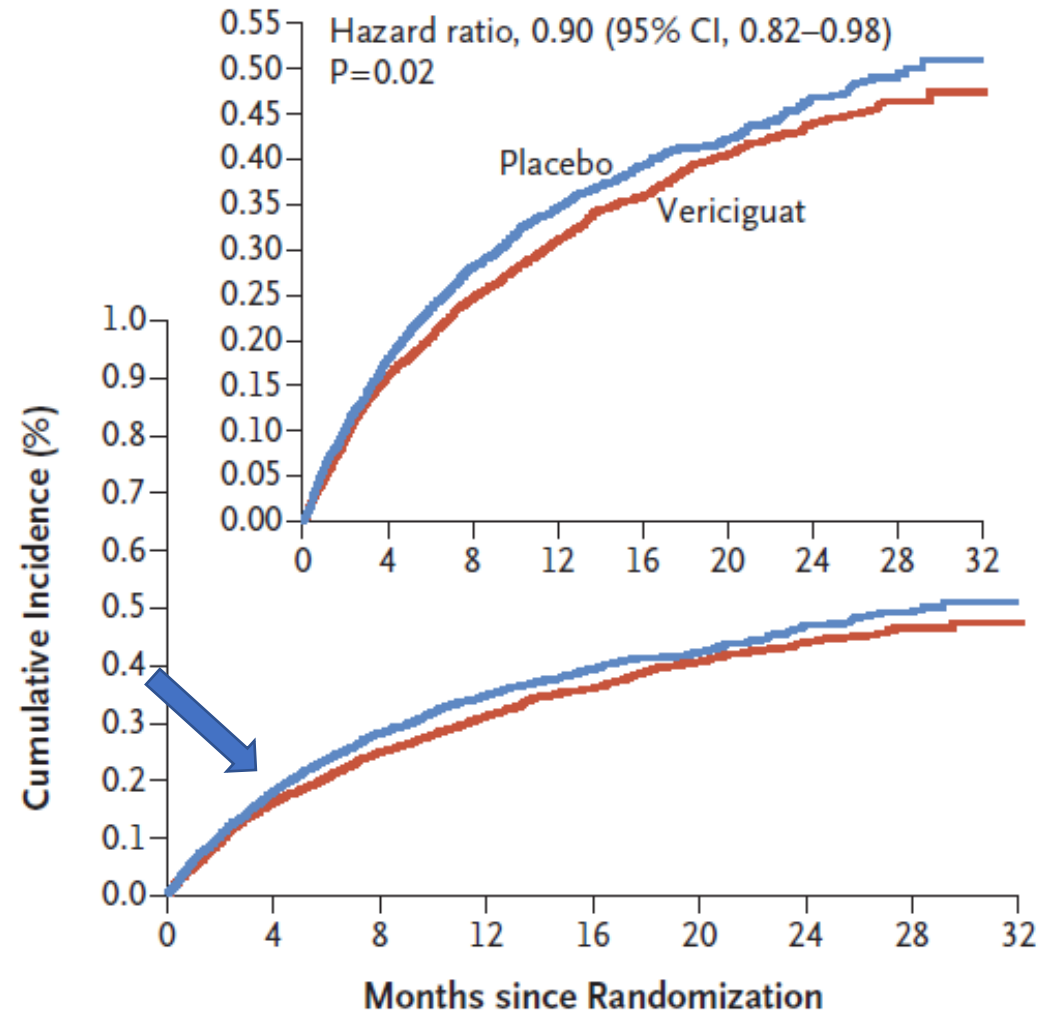
- chronic heart failure (NYHA II-IV)
- EF < 45%
- BNP > 300 in SR or > 500 in AF
- **Worsening HF**

- 93.1% BB
- 73.4% ACEi/ARB
- 14.5% ARNi
- 70.3% MRA

Median follow-up: 10.8 months

Annual NNT: 24

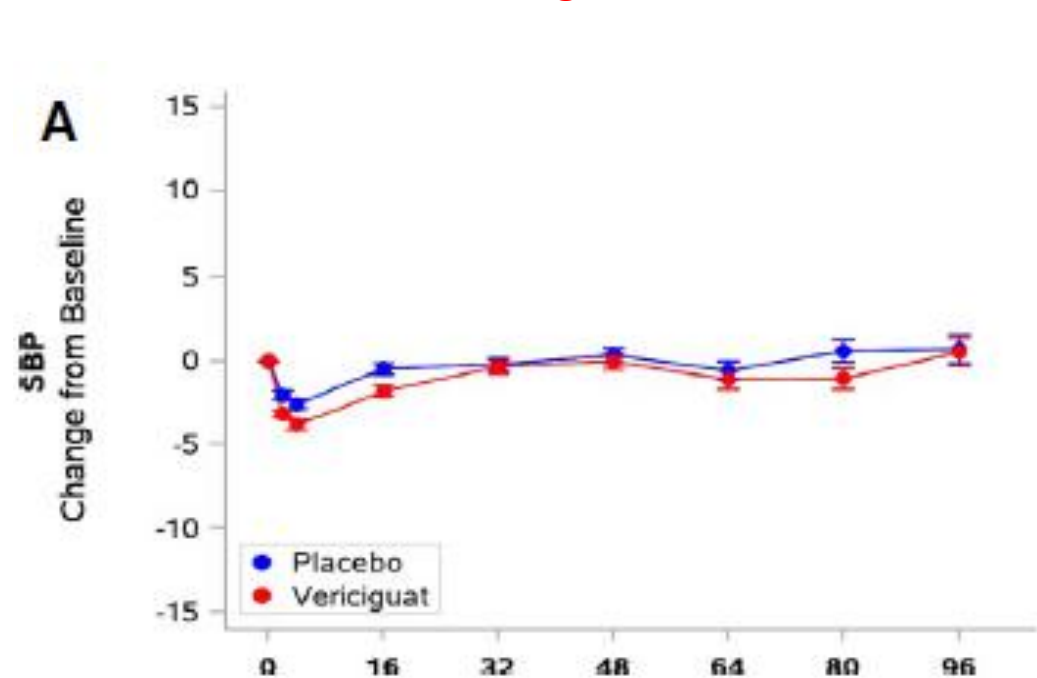
Death from cardiovascular causes or first hospitalization for heart failure



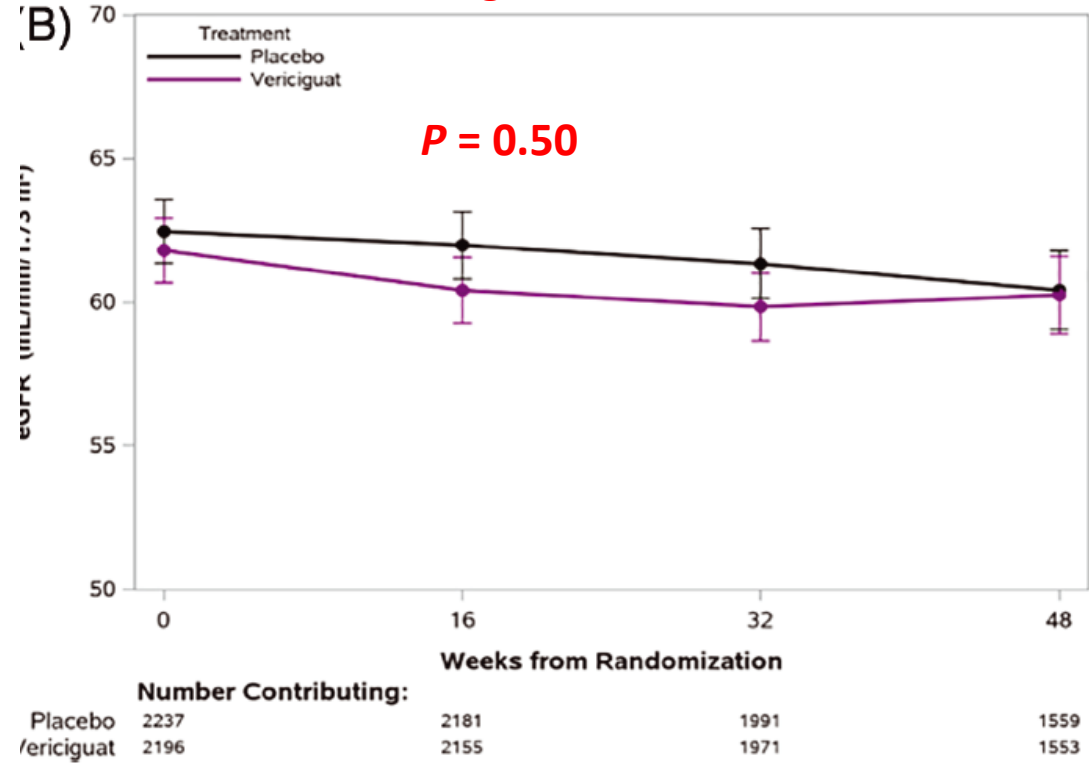
Blood Pressure and Safety Events With Vericiguat in the VICTORIA Trial

Renal function and the effects of vericiguat in patients with worsening heart failure with reduced ejection fraction: insights from the VICTORIA (Vericiguat Global Study in Subjects with HFrEF) trial

Change in Blood Pressure



Change in GFR

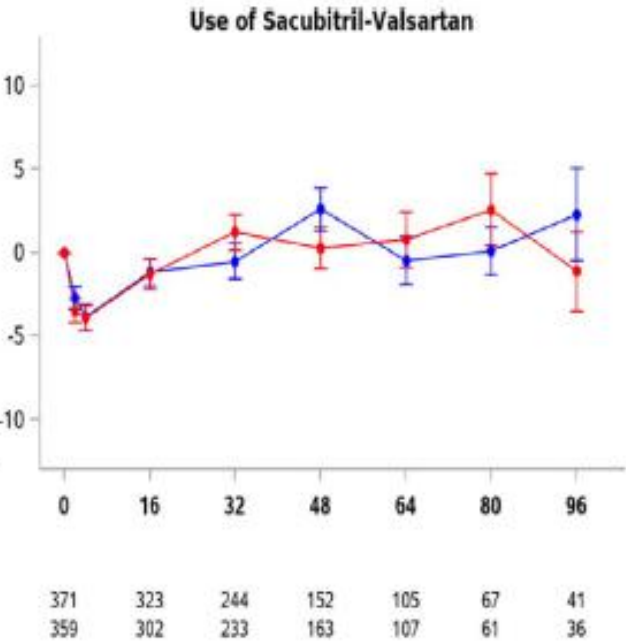


Exclusion criteria : systolic blood pressure <100 mm Hg.

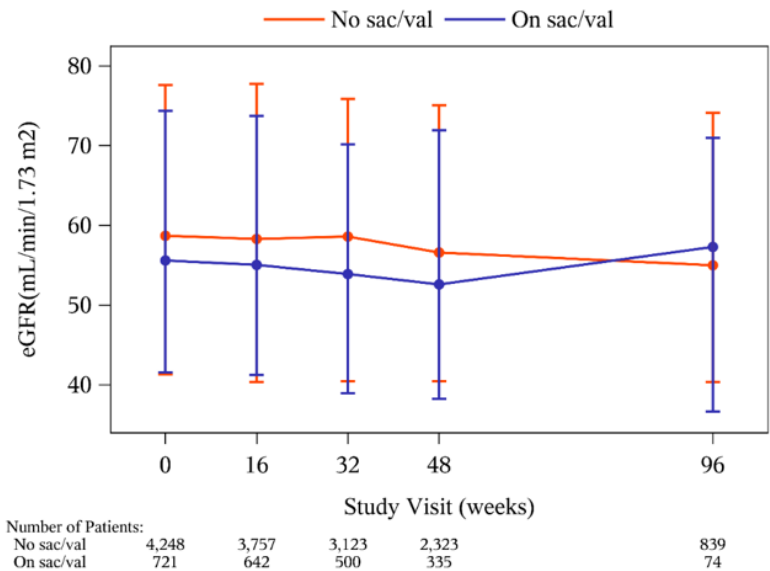
Exclusion criteria : GFR < 15

Efficacy and safety of vericiguat in patients with heart failure with reduced ejection fraction treated with sacubitril/valsartan: insights from the VICTORIA trial

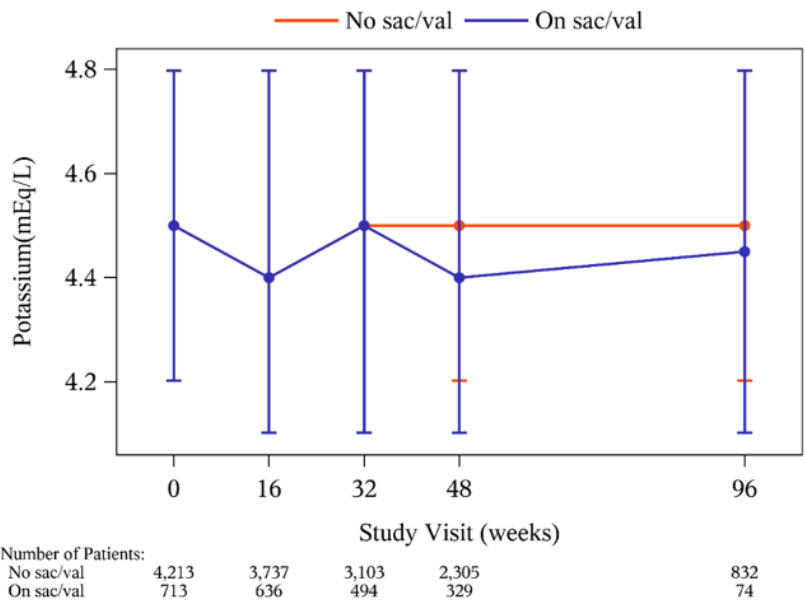
Blood pressure



GFR



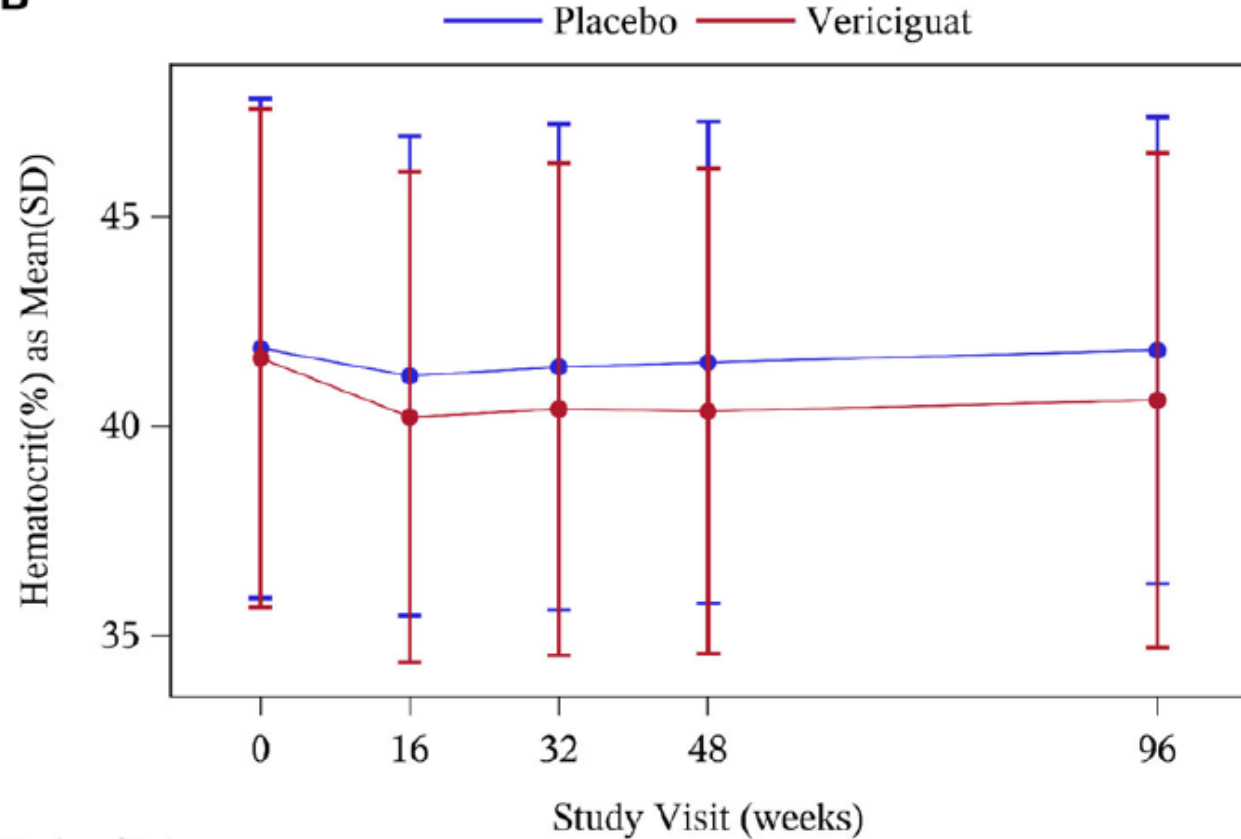
Potassium



Hemoglobin and Clinical Outcomes in the Vericiguat Global Study in Patients With Heart Failure and Reduced Ejection Fraction (VICTORIA)

Hematocrit

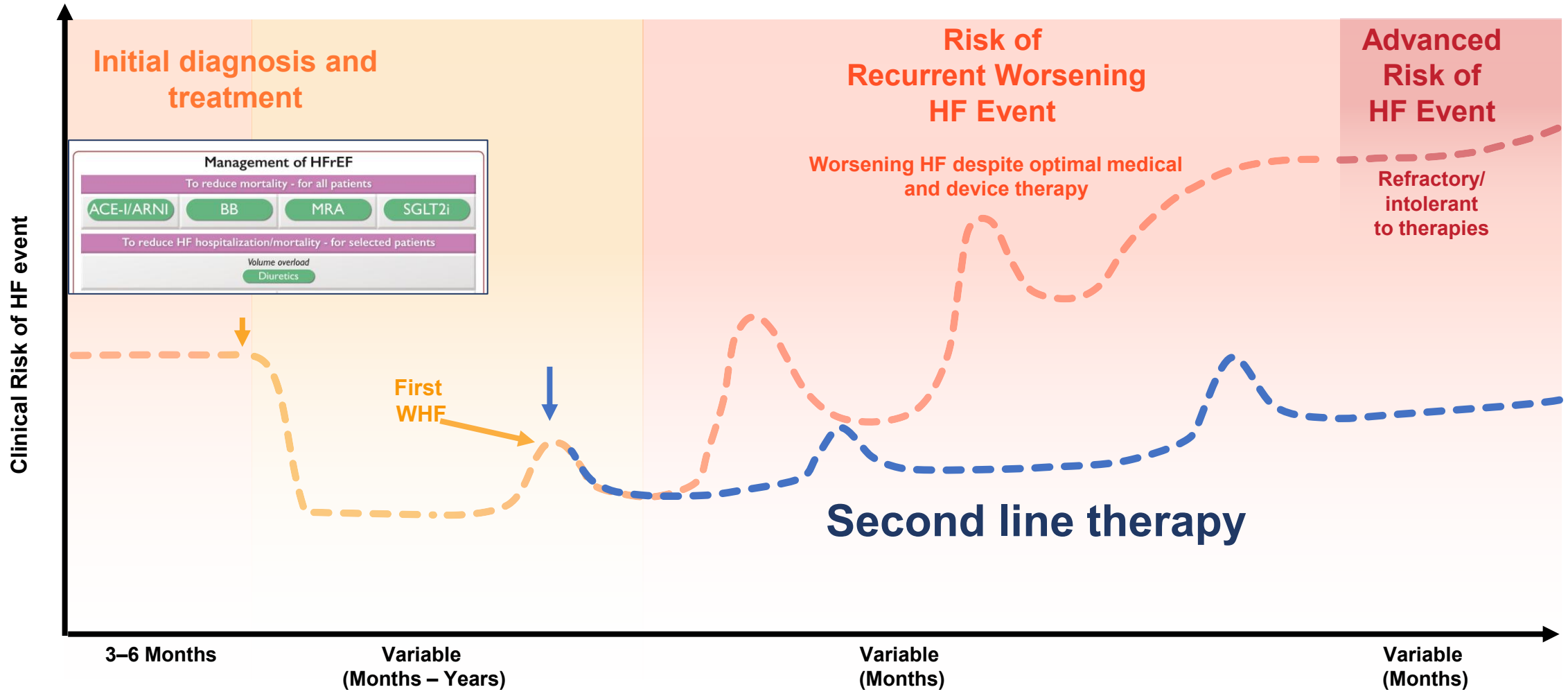
B



Number of Patients:

Placebo	2,407	2,124	1,762	1,314	491
Vericiguat	2,405	2,107	1,779	1,307	495

	Vericiguat Mean (SE)*	Placebo Mean (SE)*	Difference Estimate* (V-P) (95% CI)	P-value†
Hematocrit				
Baseline	41.62 (0.122)	41.85 (0.122)	-0.039 (-0.102, 0.023)	0.220
Week 16	40.19 (0.130)	41.20 (0.126)	-0.882 (-1.121, -0.642)	<.001
Week 32	40.41 (0.143)	41.45 (0.141)	-0.857 (-1.132, -0.581)	<.001
Week 48	40.42 (0.165)	41.59 (0.162)	-0.898 (-1.213, -0.582)	<.001
Week 96	40.74 (0.288)	41.93 (0.269)	-1.013 (-1.554, -0.472)	<.001



Vericiguat in ambulatory patients with chronic heart failure with reduced ejection fraction: Results of the VICTOR trial

Faiez Zannad, MD, PhD, on behalf of Javed Butler (co-PI) and the VICTOR Executive Committee
Global CardioVascular Clinical Trialists Forum (CVCT) and Université de Lorraine, Nancy, France



VICTOR: study design (NCT05093933)

Phase 3, double-blind, placebo-controlled study in people with HFrEF^{1,2}

Key inclusion criteria

- HFrEF (LVEF $\leq 40\%$)
- No recent HF events (no HHF for 6 months, no IV diuretics for 3 months)
- NT-proBNP levels of 600–6000 pg/mL[†]
- No recent changes in doses of GDMT

6105 participants , **482** sites, **36** countries

Median follow-up time:

- 18.5 months

Primary endpoints

CV death or first HHF

Secondary endpoints (Hierarchical)

Study drug discontinuation due to adverse events (excluding discontinuation due to death)

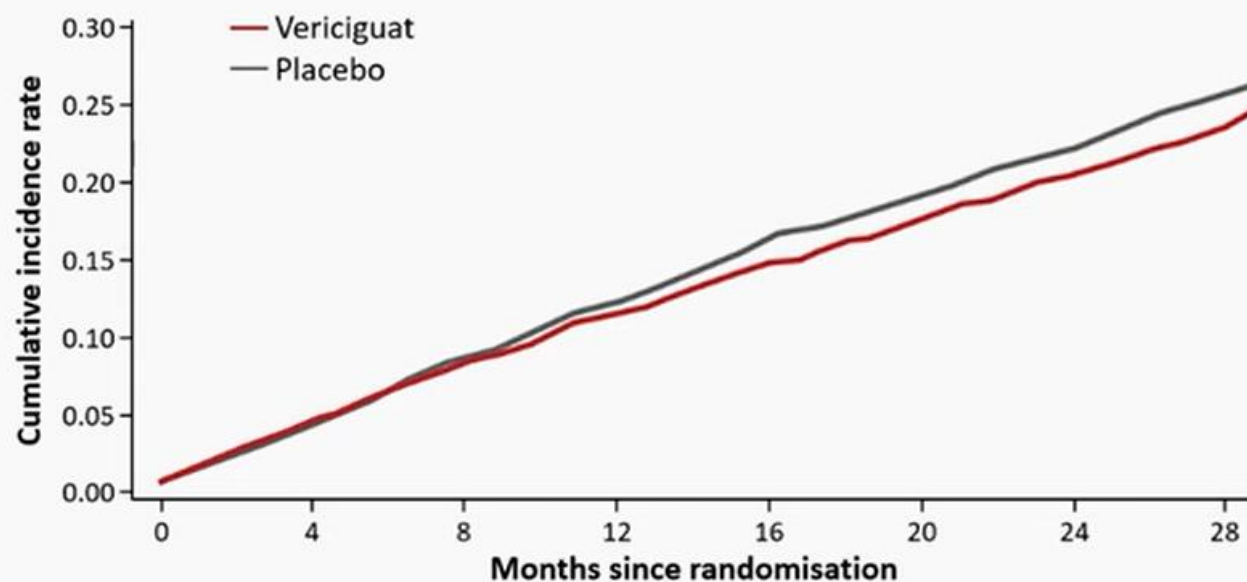
- 8.4% of participants in the vericiguat group
- 7.3% of participants in the placebo group

Mean dose:

- 8.2 mg in the vericiguat group
- 8.5 mg in the placebo group

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Vericiguat: 549 (**18.0%**)
Placebo: 584 (**19.1%**)
HR **0.93** (95% CI 0.83–1.04); P=0.22

Generally consistent across
prespecified subgroups

		Number of participants at risk							
Vericiguat		3053	2927	2797	2581	1917	1352	849	459
Placebo		3052	2929	2771	2543	1879	1314	823	442
		Cumulative number of events up to the time point							
Vericiguat		0	109	228	333	409	462	505	527
Placebo		0	108	242	355	442	506	547	574

Vericiguat in ambulatory patients with chronic heart failure with reduced ejection fraction: Results of the VICTOR trial

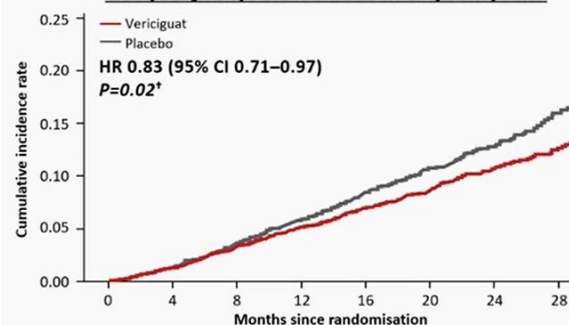
Faiez Zannad, MD, PhD, on behalf of Javed Butler (co-PI) and the VICTOR Executive Committee
Global CardioVascular Clinical Trialists Forum (CVCT) and Université de Lorraine, Nancy, France



Effects of vericiguat on mortality

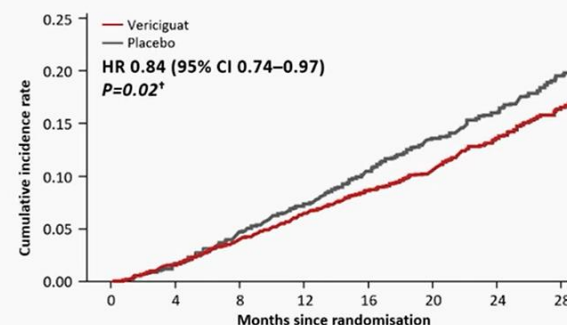
CV death^{1,2}

Prespecified powered secondary endpoint



Number of participants at risk							
Vericiguat	3053	3000	2928	2752	2092	1516	968
Placebo	3052	3003	2910	2728	2050	1456	940
Cumulative number of events up to the time point							
Vericiguat	0	37	99	156	201	234	263
Placebo	0	40	111	177	243	287	314

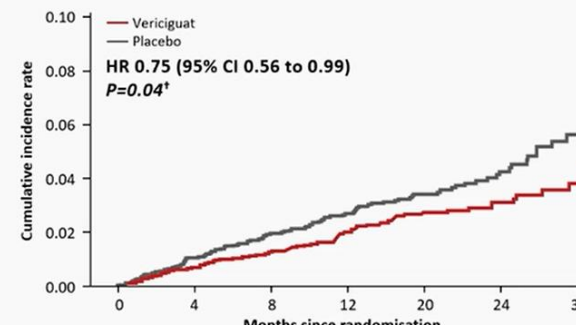
All-cause death^{1,2}



Number of participants at risk							
Vericiguat	3053	3000	2928	2752	2092	1516	968
Placebo	3052	3003	2910	2728	2050	1456	940
Cumulative number of events up to the time point							
Vericiguat	0	51	123	197	254	292	335
Placebo	0	47	140	223	307	368	402

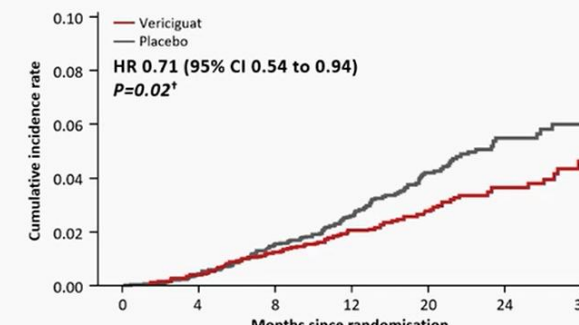
Mode of death: Exploratory analyses

Sudden cardiac death^{1,2}



Number of participants at risk						
Vericiguat	3053	2984	2894	2241	1516	838
Placebo	3052	2978	2862	2208	1456	816
Cumulative number of events up to the time point						
Vericiguat	0	20	37	57	70	75
Placebo	0	32	58	77	92	100

HF-related death^{1,2}



Number of participants at risk						
Vericiguat	3053	2982	2887	2229	1505	827
Placebo	3052	2970	2850	2189	1438	798
Cumulative number of events up to the time point						
Vericiguat	0	13	38	59	73	83
Placebo	0	12	46	73	103	118

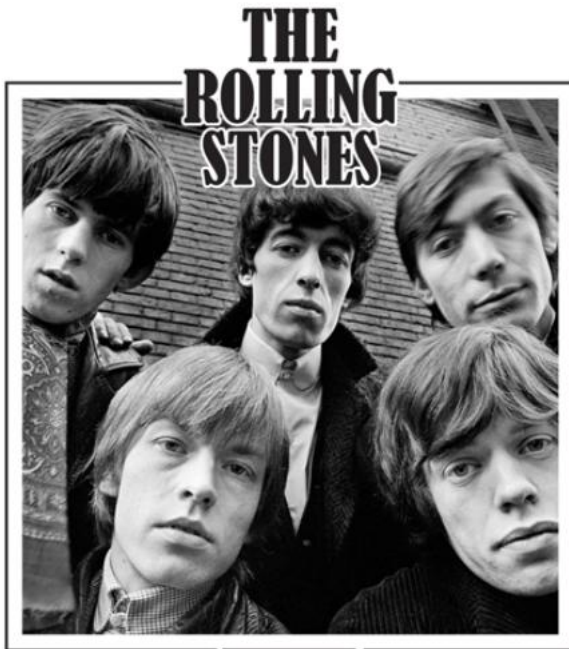
Baseline demographics and medical therapies

Characteristic	Vericiguat (N=3053)	Placebo (N=3052)
Age, mean, years	67	67
Female sex, n (%)	727 (24)	713 (23)
Race, n (%)		
White	1942 (64)	1992 (65)
Black (expanded)*	343 (11)	313 (10)
American Indian or Alaskan	159 (5)	142 (5)
Native Hawaiian or Pacific Islander	4 (0.1)	7 (0.2)
Asian	383 (13)	363 (12)
Multiracial	313 (10)	330 (11)
Comorbidities, n (%)		
Diabetes	1274 (42)	1311 (43)
Atrial fibrillation	1135 (37)	1182 (39)
Hypertension	2153 (71)	2176 (71)
Coronary artery disease	1861 (61)	1883 (62)
Systolic blood pressure, mean $\pm$ SD, mmHg	121 $\pm$ 16	122 $\pm$ 16
Haemoglobin, mean $\pm$ SD, g/dL	14 $\pm$ 3	14 $\pm$ 2
Body mass index, mean, kg/m ²	28	29
NT-proBNP, median, pg/mL	1370	1381
No prior HHF, n (%)	1426 (47)	1473 (48)
LVEF, mean, %	31	30
Estimated glomerular filtration rate, mean, mL/min/1.73 m ²	71	71

Medical therapy, n (%)	Vericiguat (N=3053)	Placebo (N=3052)
Loop diuretics	2131 (70)	2129 (70)
Beta-blockers	2886 (95)	2880 (94)
Angiotensin-converting enzyme inhibitor or angiotensin receptor blocker	1150 (38)	1188 (39)
ARNI	1734 (57)	1682 (55)
Mineralocorticoid receptor antagonist	2358 (77)	2390 (78)
SGLT2i	1812 (59)	1798 (59)
Implantable cardioverter-defibrillator	993 (33)	1016 (33)
Cardiac resynchronisation therapy	464 (15)	440 (14)

*Expanded Black includes participants who identify as Black, or Multi-racial and Black.

Fab Five



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