Patient With Heart Failure – Visit 1

Patient: 65-year-old man

Relevant medical history:

- HFrEF (NYHA II)
- CKD 3b
- Diabetes mellitus
- History of myocardial infarction
- Fatigue

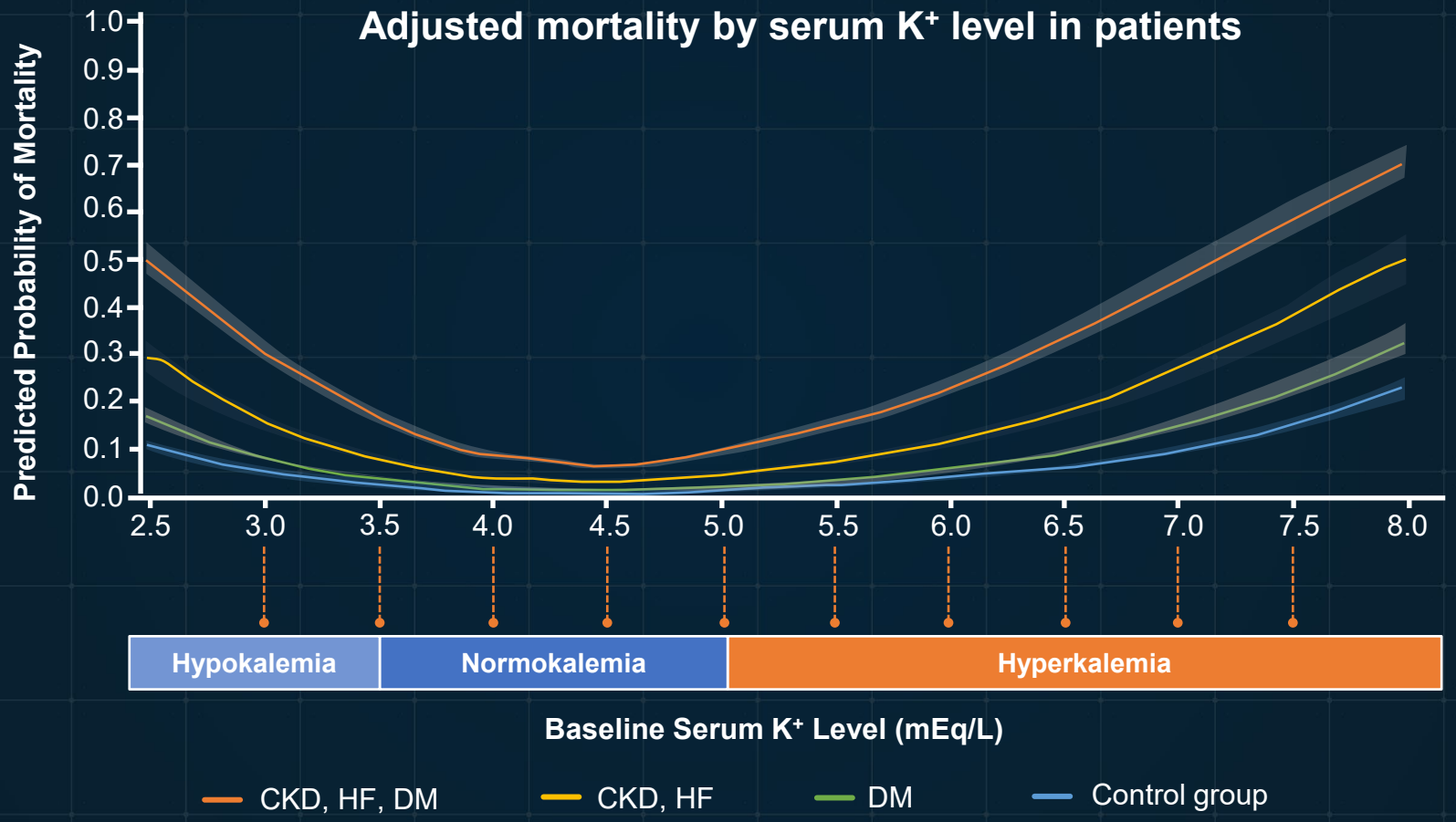
Key medications:

- Carvedilol 50 mg
- Enalapril 10 mg
- Spironolactone 25 mg
- Dapagliflozin 10 mg
- Furosemide 40 mg
- Aspirin 100 mg

Clinical findings:

- NT-proBNP 1002 pg/mL
- Creatinine 1.9 mg/dL
- eGFR 38 mL/min/1.73 m^2
- Proteinuria A2
- **Potassium 5.6 mEq/L**

K+ Outside the Normal Range: Higher Mortality Risk

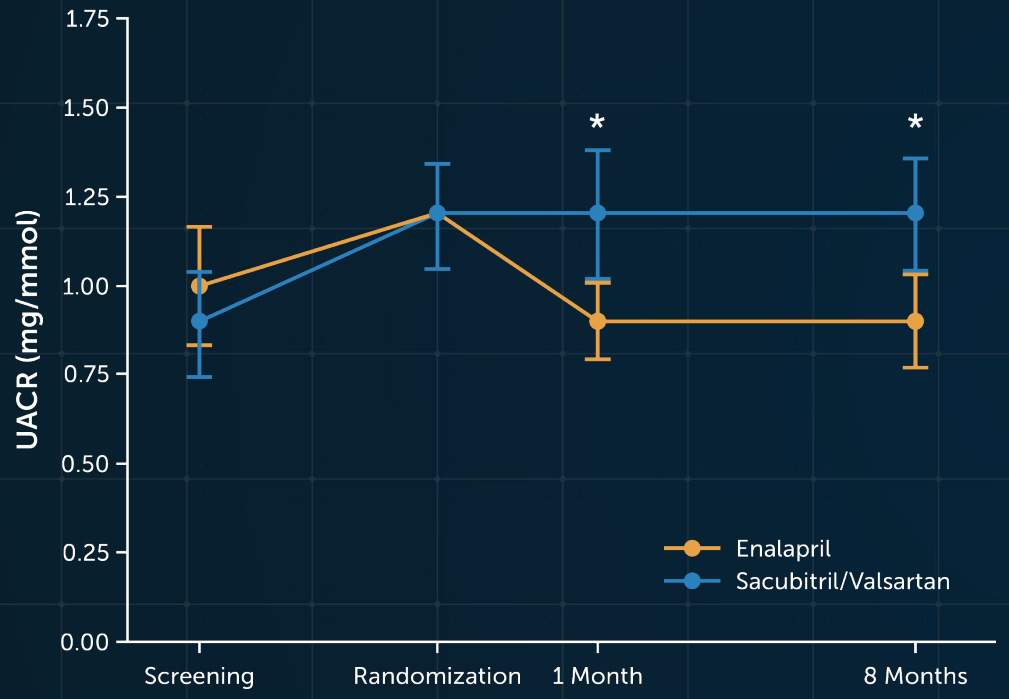


CKD, chronic kidney disease; DM, diabetes mellitus; HF, heart failure; K^+, potassium.

Collins AJ, et al. *Am J Nephrol*. 2017;46(3):213-221.

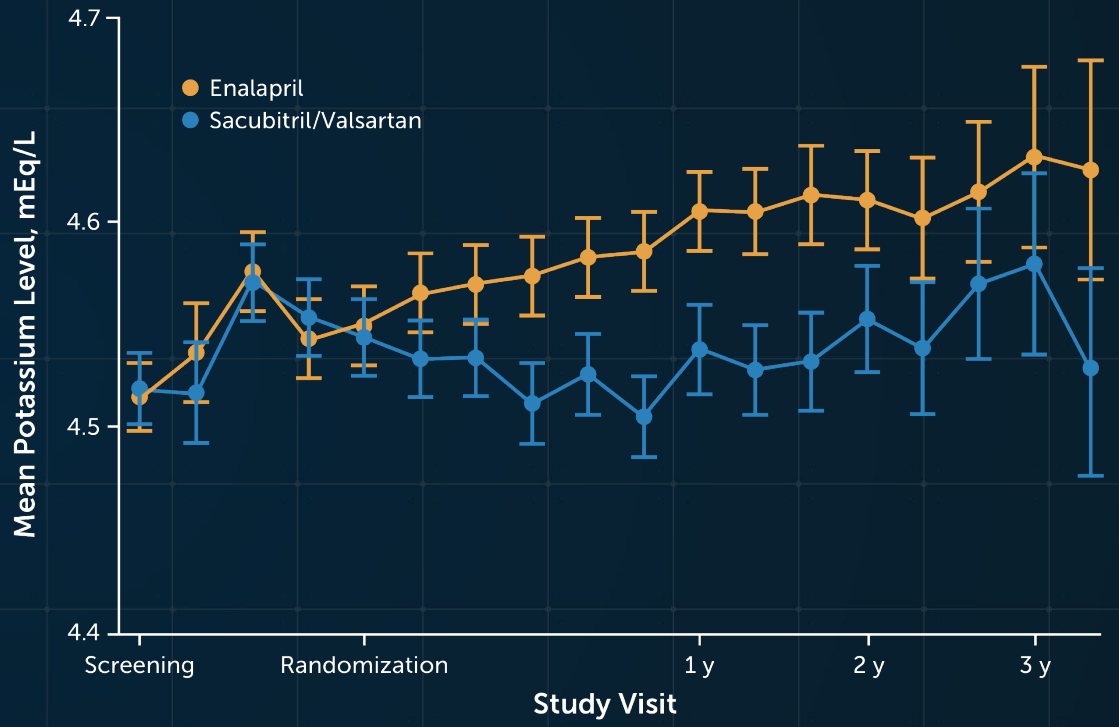
The PARADIGM-HF Study

UACR levels over time stratified by random treatment assignment



Compared with enalapril, sacubitril/valsartan led to a slower rate of decrease in the eGFR and improved cardiovascular outcomes, even in patients with chronic kidney disease, despite causing a modest increase in UACR.

Serum potassium level by study visit, according to treatment assignment, among participants treated with an MRA at baseline in PARADIGM-HF



Among MRA-treated patients with symptomatic HFrEF, severe hyperkalemia is more likely during treatment with enalapril than with sacubitril/valsartan.

eGFR, estimated glomerular filtration rate; HFrEF, heart failure with reduced ejection fraction; MRA, mineralocorticoid receptor antagonist; UACR, urine albumin-to-creatinine ratio.

Damman K, et al. *JACC Heart Fail*. 2018;6(6):489-498. Desai AS, et al. *JAMA Cardiol.* 2017;2(1):79-85.

How Does the Nephrologist Address Hyperkalemia?

- Adjust loop diuretics?
- Switch ACEI to ARNI
- Call the nephrologist
  - Consider guideline-directed use of potassium binder

Patient With Heart Failure – Visit 2

Physical examination:
- Mild ankle edema
- NYHA III

Symptoms:
- Diminished exercise capacity and subsequent breathlessness and fatigue

Key medications:

Carvedilol	50 mg
Sacubitril/valsartan	100 mg
Dapagliflozin	10 mg
Furosemide	40 mg
Atorvastatin	40 mg
Aspirin	100 mg

Clinical findings:

NT-proBNP	**5128 pg/mL**
Creatinine	1.9 mg/dL
eGFR	**38 mL/min/1.73 m^2**
Proteinuria	A2
Potassium	**5.8 mEq/L**

Selected RAASi Dosing-Related Endpoints: DIAMOND

Patients treated with patiromer were:

26% LESS LIKELY

to have MRA dose reduced/discontinued or have K^+ >5.5 mmol

21.6% vs 26.7%; HR (95% CI): 0.74 (0.57; 0.97); *P* = 0.030

35% LESS LIKELY

to have MRA discontinued

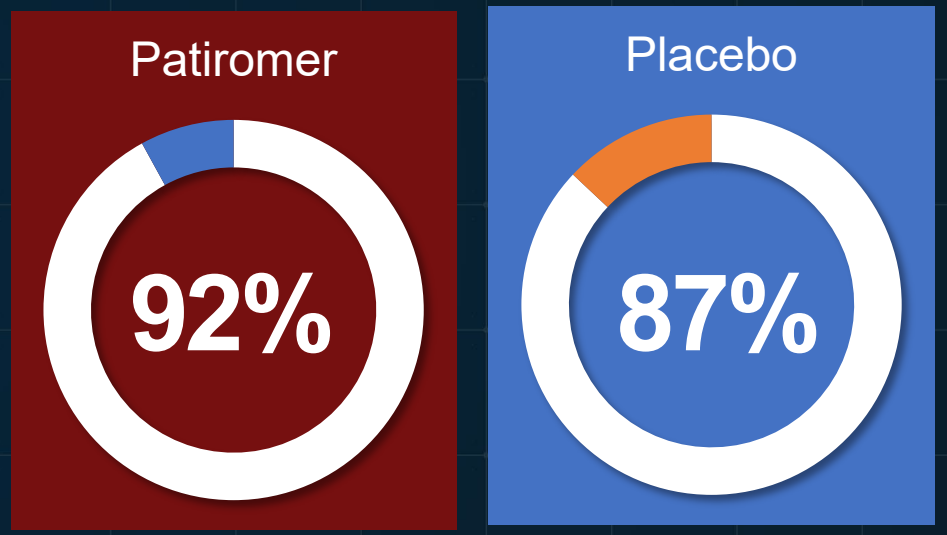
4.6% vs 7.1%; HR (95% CI): 0.64 (0.36; 1.12); *P* = 0.117

26% LESS LIKELY

to have ACEI/ARB/ARNI discontinued

2.7% vs 3.6%; HR (95% CI): 0.74 (0.35; 1.57); *P* = 0.438

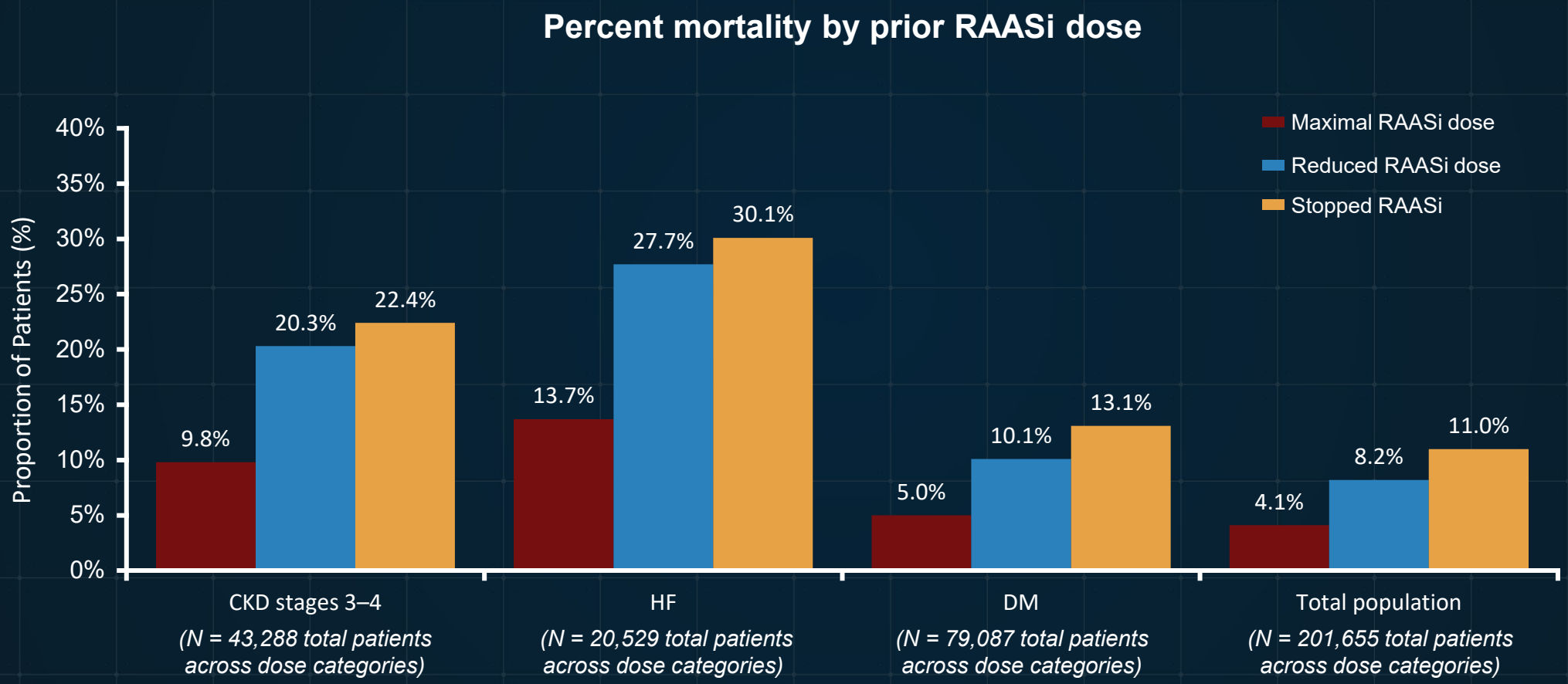
Patients at end of study on ≥50% of target dose of ACEI/ARB/ARNI + ≥25 mg daily MRA dose



ARR: 5%
NNT: 20
***P* = 0.015**

ACEI, angiotensin-converting enzyme inhibitor; ARB, angiotensin II receptor blocker; ARNI, angiotensin receptor-neprilysin inhibitor; ARR, absolute risk reduction; MRA, mineralocorticoid receptor antagonist; NNT, number needed to treat; RAASi, renin-angiotensin-aldosterone system inhibitor. Butler J, et al. *Eur Heart J*. 2022;43(41):4362-4373.

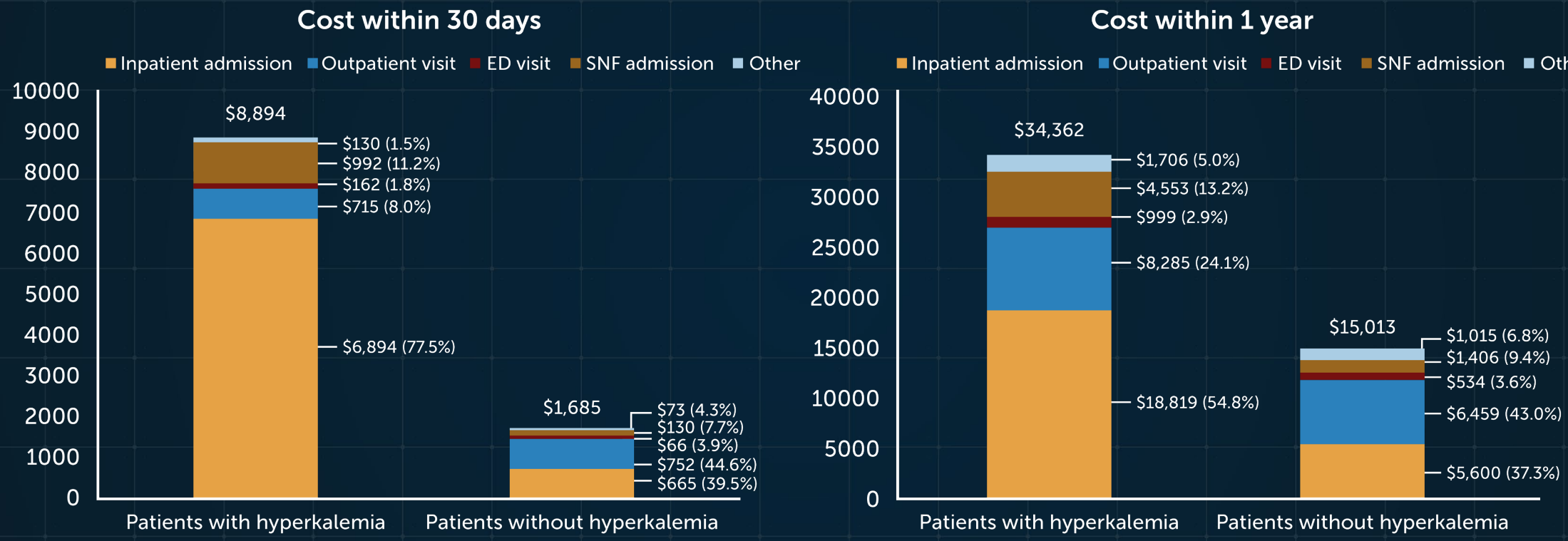
2-Fold Increased Mortality Risk Associated With RAASi Dose Reduction/Discontinuation, Irrespective of Comorbidities



CKD, chronic kidney disease; DM, diabetes mellitus; HF, heart failure; RAASi, renin-angiotensin-aldosterone system inhibitor.

Epstein M, et al. *Am J Manag Care*. 2015;21(11 Suppl):S212-S220.

Association of Hyperkalemia With Increased Costs and Hospitalizations



Comparison of mean all-cause medical costs within 30 days and 1 year between matched patients with and without hyperkalemia in the 5% Medicare sample (2010-2014). Hospice and home health agency visits were combined with "Other claims," including claims for durable medical equipment such as blood sugar monitors, walkers, hospital beds, etc.

ED, emergency department; SNF, skilled nursing facility.

Mu F, et al. *Curr Med Res Opin*. 2020;36(8):1333-1341.

Key Takeaway: Patrick Rossignol, MD

"We should aim at achieving the highest tolerated dose of GDMT…"

Key Takeaways: Antoni Bayés-Genís, MD

“There should be more interaction between cardiologists and nephrologists…”

“We should consider potassium binders earlier to be able to keep GDMT at the highest recommended doses.”