

WHERE IS HYPERKALEMIA DIAGNOSED AND DOES IT MATTER? RESULTS FROM A LARGE EMR NETWORK IN THE US



TriNetX

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OBJECTIVES

The aims of this analysis were to describe health outcomes and treatment-related differences among incident hyperkalemia (HK) patients diagnosed in ambulatory, inpatient, and emergency room (ER) settings.

METHODS

Patients with an incident hyperkalemia diagnosis, confirmed by serum potassium (K) ≥ 5.0 mmol/L, following a kidney disease diagnosis between 2010-2018 were identified using the TriNetX platform, a U.S.-based electronic medical record network (Figure 1).

Treatment administered on the same day, health outcomes within 30-days, and retesting of K within 30-days and 1-year following the incident diagnosis of HK were compared using chi-square tests and Kaplan-Meier curves across the setting of the diagnosis: ambulatory, inpatient and ER.

All criteria were defined by ICD-9/10, LOINC, CPT, and RxNorm codes.

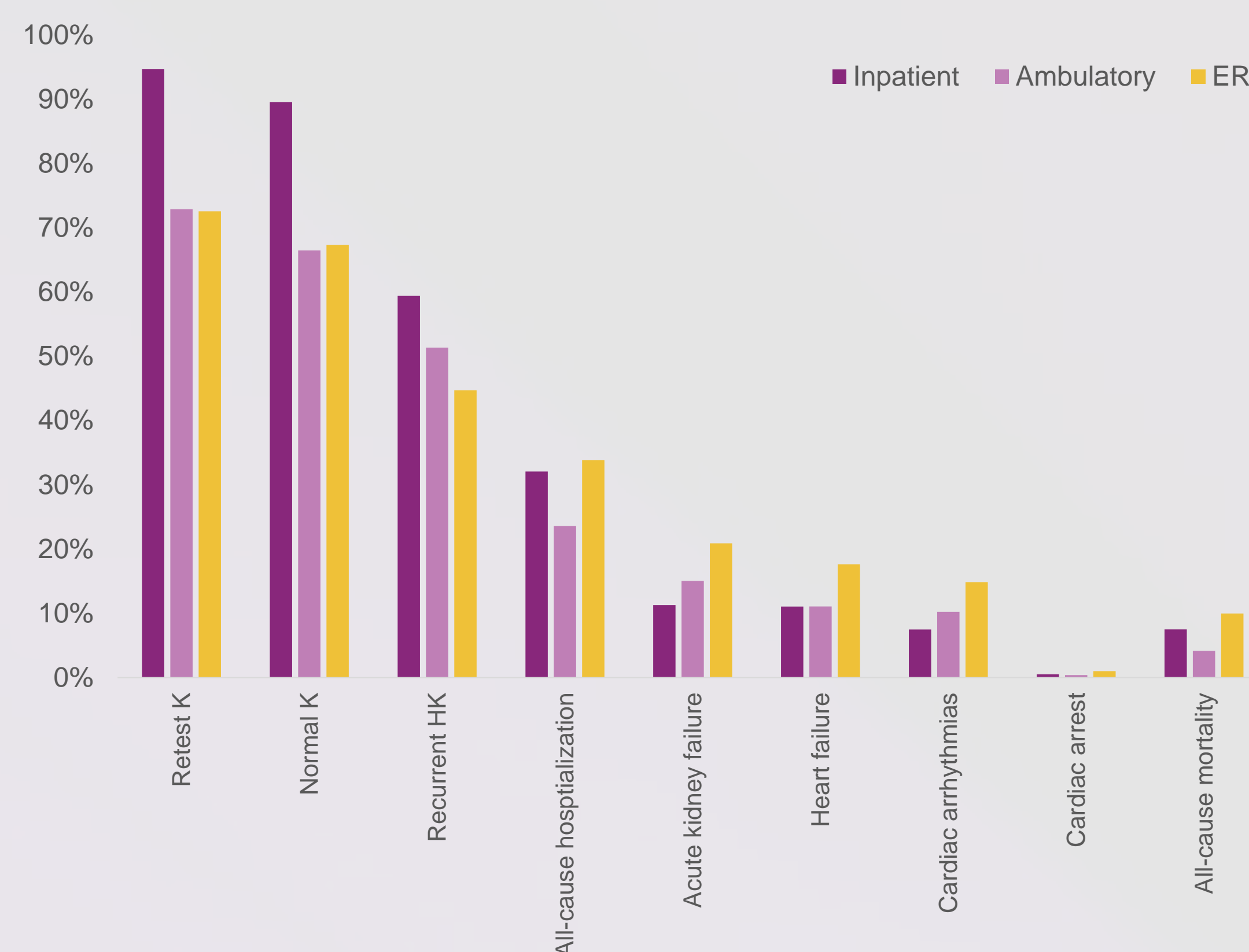


Figure 2. Outcomes 30-days after index HK event
p<0.01 for all comparisons based on chi-square tests

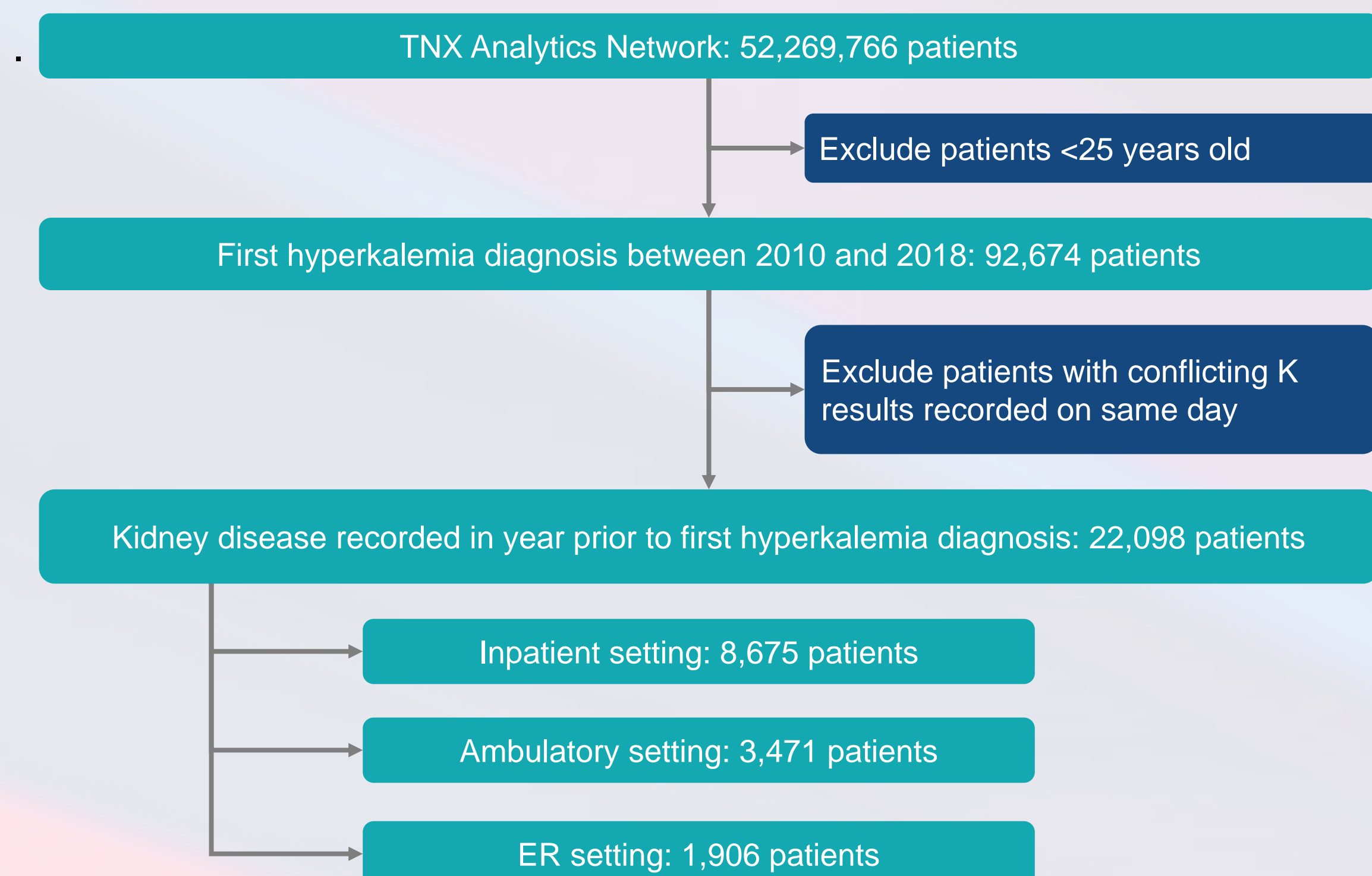


Figure 1. Patient flow diagram

RESULTS

The mean age of patients was 68 in inpatient (N=8,875), 66 in ambulatory (N=3,471), and 67 in ER (N=1,906) care settings. ER patients were more likely to experience cardiovascular complications in the 30-days following diagnosis. Although ambulatory and ER patients had a lower probability of a second K test within the first 30 days, most patients were retested within a year of the incident HK diagnosis.

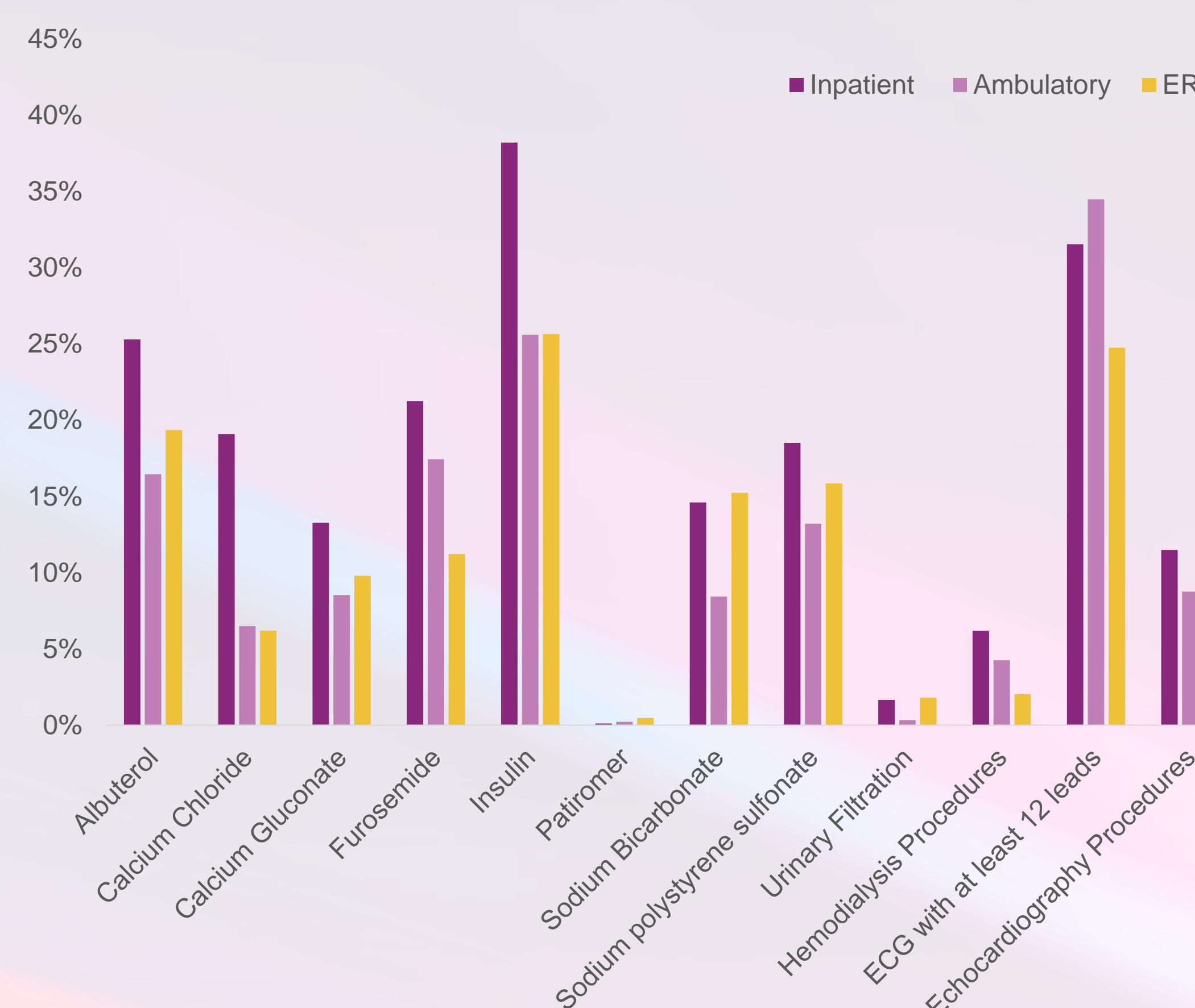


Figure 3. Treatments administered same day as index HK event
p<0.01 for all comparisons based on chi-square tests

	Inpatient		Ambulatory		ER		p
	N	%	N	%	N	%	
Total N	8,675		3,471		1,906		
Female	4,309	50	1,706	49	923	48	p = 0.76
White	4,924	57	2,249	65	194	10	p < 0.01
Black or African American	1,990	23	587	17	1,488	78	p < 0.01
Hispanic or Latino	280	3	236	7	191	10	p < 0.01
Essential (primary) hypertension	5,735	66	2,603	75	1,503	79	p < 0.01
Hyperlipidemia, unspecified	4,943	57	1,75	50	1,010	53	p < 0.01
Type 2 diabetes mellitus	4,856	56	1,609	46	945	50	p < 0.01
Hypertensive chronic kidney disease	4,807	55	1,460	42	1,017	53	p < 0.01
Ischemic heart diseases	4,116	47	1,253	36	811	43	p < 0.01
Other hyperlipidemia	3,061	35	1,365	39	808	42	p < 0.01
Heart failure	3,950	46	997	29	702	37	p < 0.01
Atrial fibrillation and flutter	2,509	29	681	20	522	27	p < 0.01
Diseases of liver	1,597	18	581	17	400	21	p < 0.01
Cerebrovascular diseases	1,620	19	555	16	287	15	p < 0.01
Pure hypercholesterolemia	1,345	16	476	14	346	18	p < 0.01
Type 1 diabetes mellitus	787	9	367	11	233	12	p < 0.01
Mixed hyperlipidemia	356	4	252	7	199	10	p < 0.01
Antimicrobials	6,517	75	2,369	68	1,077	57	p < 0.01
Beta blockers	5,114	59	1,972	57	1,349	71	p < 0.01
Diuretics	4,668	54	1,932	56	968	51	p = 0.07
Antilipemic agents	3,744	43	1,684	49	821	43	p < 0.01
Antiarrhythmics	3,216	37	1,610	46	711	37	p < 0.01
Calcium channel blockers	3,264	38	1,330	38	619	32	p < 0.01
Ace inhibitors	2,563	30	1,317	38	647	34	p < 0.01
Antihypertensives	3,104	36	1,033	30	883	46	p < 0.01
Antianginals	1,972	23	712	21	496	26	p < 0.01
Angiotensin II inhibitors	1,123	13	593	17	260	14	p < 0.01
Alpha blockers	1,039	12	394	11	225	12	p = 0.66
Other cardiovascular agents	426	5	182	5	84	4	p = 0.42

Table 1. Baseline characteristics by setting of care

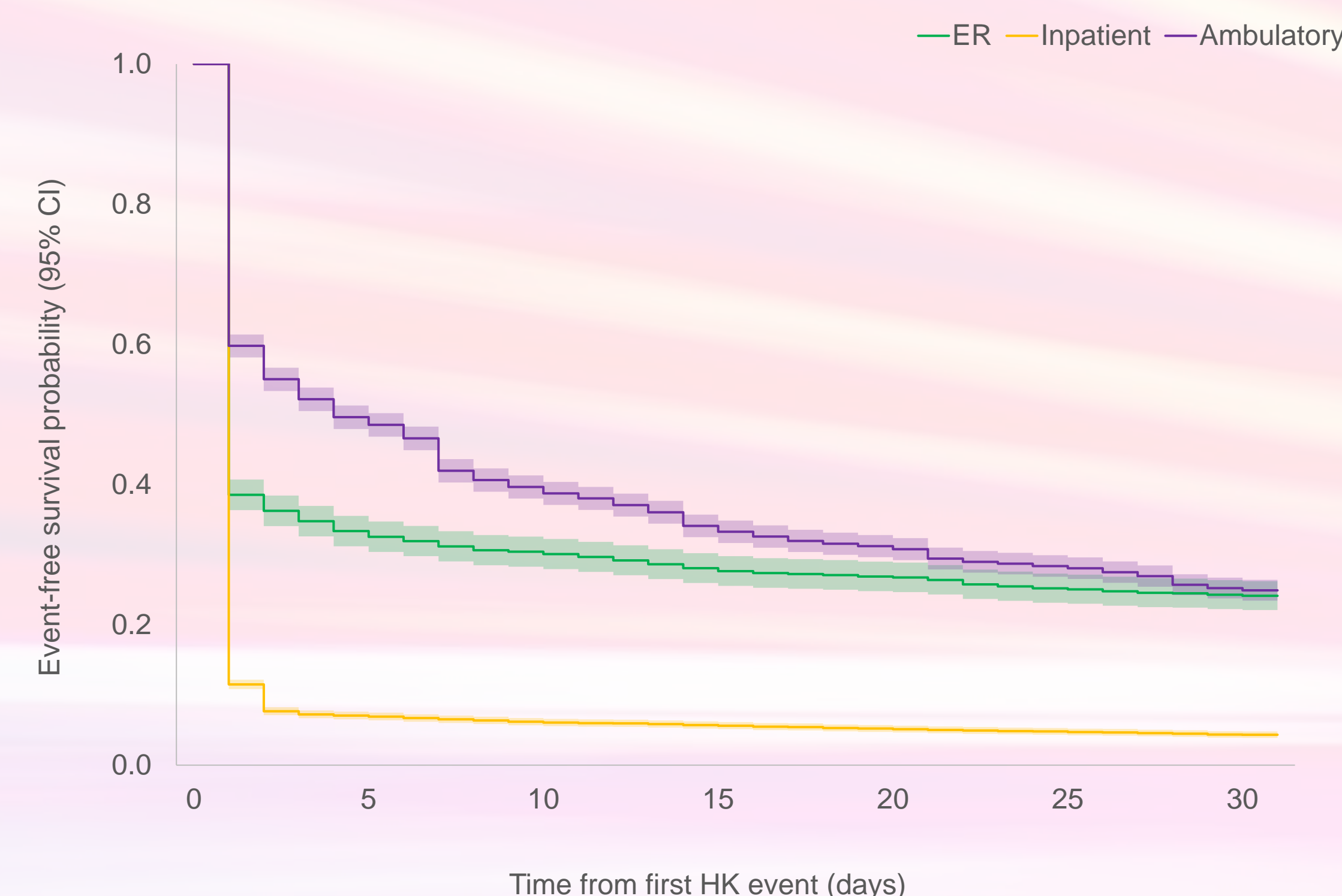


Figure 4. Retest of K within first 30-days of index HK event

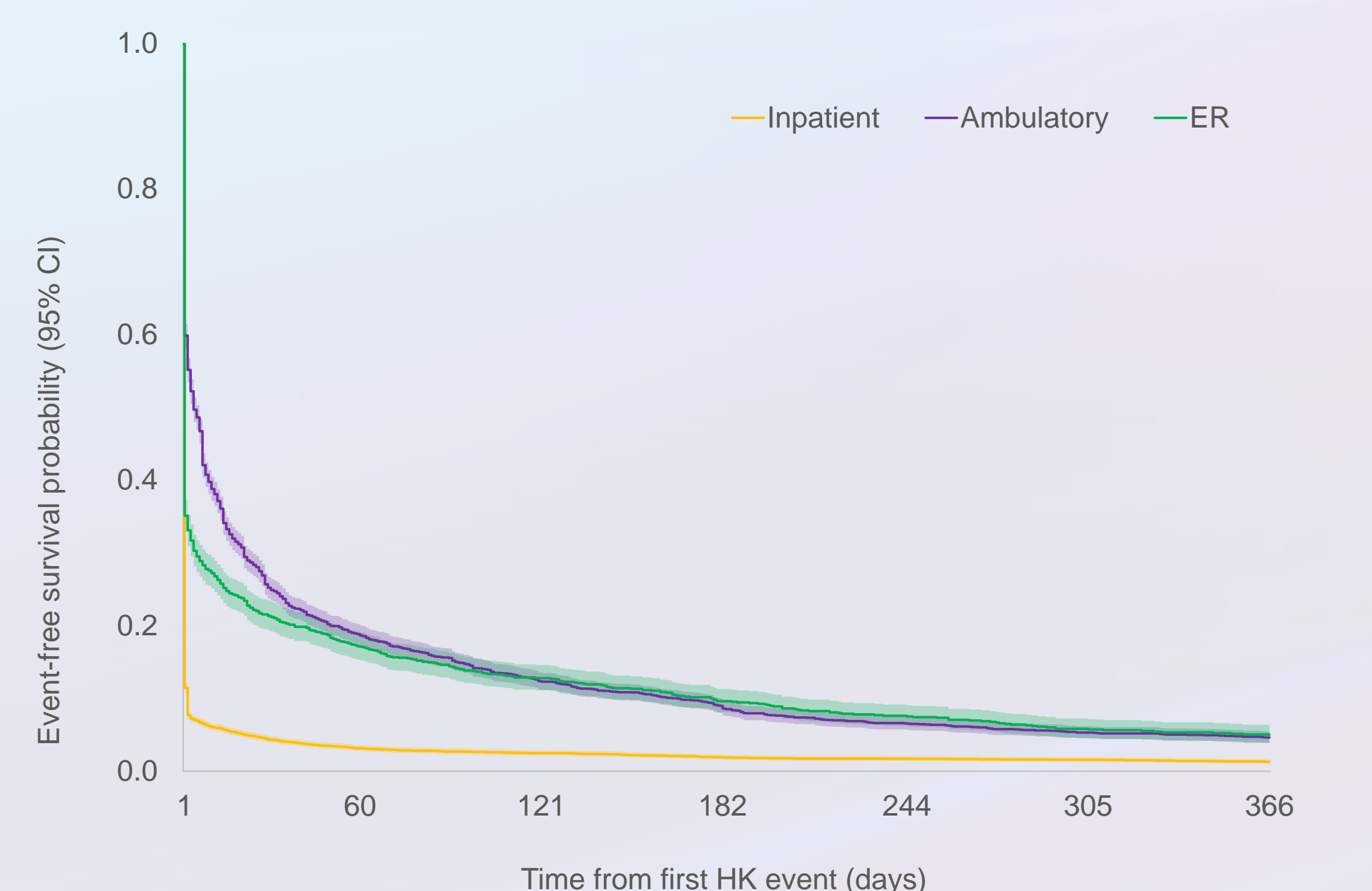


Figure 5. Retest of K within first year of index HK event

CONCLUSIONS

Treatments and outcomes differed for patients who experienced a hyperkalemia event in an inpatient, ambulatory, or ER care setting. Novel treatments for hyperkalemia require a chronic diagnosis, which entails at least two K tests. Previous studies show retesting is uncommon, especially in primary care settings. However most patients in the US receive a second K test within a year of the incident hyperkalemia event, regardless of care setting.