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KIDNEY SUPPORTIVE CARE: HEALTH SERVICE UTILISATION OUTCOMES FROM A PROGRAM IMPLEMENTATION IN BRISBANE, AUSTRALIA

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Aims
- To characterize the types, frequencies and costs of services accessed by patients enrolled in Queensland's first kidney supportive care (KSC) program.
- To understand the heterogeneity of patients enrolled in KSC with respect to health service utilisation, in particular with respect to their dialysis status.

Background
- KSC is a novel, person-centred, interdisciplinary model of care designed to align with the needs, preferences and priorities of people with advanced CKD or ESKD and their families.[1]

Methods
- Prospectively collected information on KSC patients' demographics and healthcare services accessed in the Brisbane area of Metro North during 52 weeks of program implementation in February 2016.
- Healthcare records included KSC program appointments, ED presentations, ambulance services, outpatient visits, inpatient episodes, and dialysis treatments. Expenditures were estimated using Queensland Health funding principles and guidelines.
- Analyses included descriptive statistics and multivariate regression models explaining variation in weekly contacts with health care and expenditures (other than dialysis).

Results
- 102 patients were included in the analysis set with a median length of program participation of 22.1 weeks (IQR 15-36). Median enrolee age was 74.5 years (IQR 63.6-83.8). 51% of patients were female and 5% were Indigenous Australians. 46% of patients had a record of dialysis during program participation; 54% received no dialysis. Haemodialysis accounted for 95% of all dialysis treatments.
- The median weekly healthcare expenditure recorded among KSC participants was A$1180, with an interquartile range of A$162 to A$1897 (Figure 1).
- Patients who received dialysis during the study duration recorded higher outpatient expenditures, A$180 per patient per week compared to A$47 in those who did not have a record of dialysis. Considering other types of health care, differences between these two groups were not statistically significant (Table 1).
- The dollar value of health care recorded during the study duration was nearly A$3 million. Dialysis accounted for 49%, inpatient services for 32%, and KSC program appointments for 4.8% of the total expenditure (Figure 2).
- Multivariate regression analyses indicated that patients who had diabetes, those receiving dialysis, and those who opted for conservative management, recorded higher utilisation and cost (Table 2).
- Longer program participation was associated with lower use and cost of health care. A 10% increase in the time in the program led to a 4% decrease in the weekly number of contacts with health care and a 6% decrease in healthcare expenditures.

Conclusions
- The program attracted patients representing various characteristics, pathways, needs and outcomes. Exploring these patterns will enable better understanding of the patient population and improved service planning, in KSC and similar programs that aim to comprehensively address needs of patients with advanced CKD and ESKD.
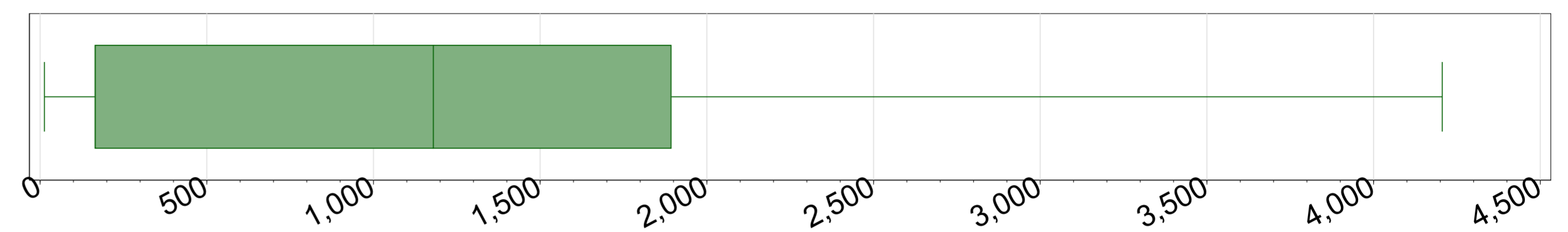
Reference
1. Purtell L, Sowa PM, Berquier I, et al. The Kidney Supportive Care program: Baseline results from a new model of care for advanced chronic kidney disease. *BMJ Supp & Pall Care*. 2018.

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Figure 1: Distribution of the weekly healthcare expenditure per patient

excludes outside values

Five outliers not shown (A$4781, A$5250, A$8273, A$10,637 and A$20,989). Outliers defined as Q3+1.5xIQR.

Table 1: Weekly healthcare expenditures by care type

	MEAN A$ (SD), PER PATIENT PER WEEK			
	All patients N=102	No dialysis* n=55	Dialysis^ n=47	p-value
KSC	84 (91)	89 (105)	78 (73)	0.552
Dialysis	569 (734)	**0 (0)**	**1,234 (587)**	**0.000**
ED	54 (100)	56 (96)	50 (105)	0.765
QAS	19 (44)	16 (30)	23 (56)	0.432
Outpatient	108 (139)	**47 (62)**	**180 (169)**	**0.000**
Inpatient excl. dialysis	712 (2,309)	502 (1,282)	958 (3,108)	0.351
All	1,546 (2,516)	**710 (1,384)**	**2,524 (3,137)**	**0.001**
All excl. dialysis	977 (2,455)	710 (1,384)	1,289 (3,286)	0.265

KSC kidney supportive care; ED emergency department; QAS Queensland Ambulance Service;
* no dialysis record within the study period; ^ ≥ 1 dialysis of any type

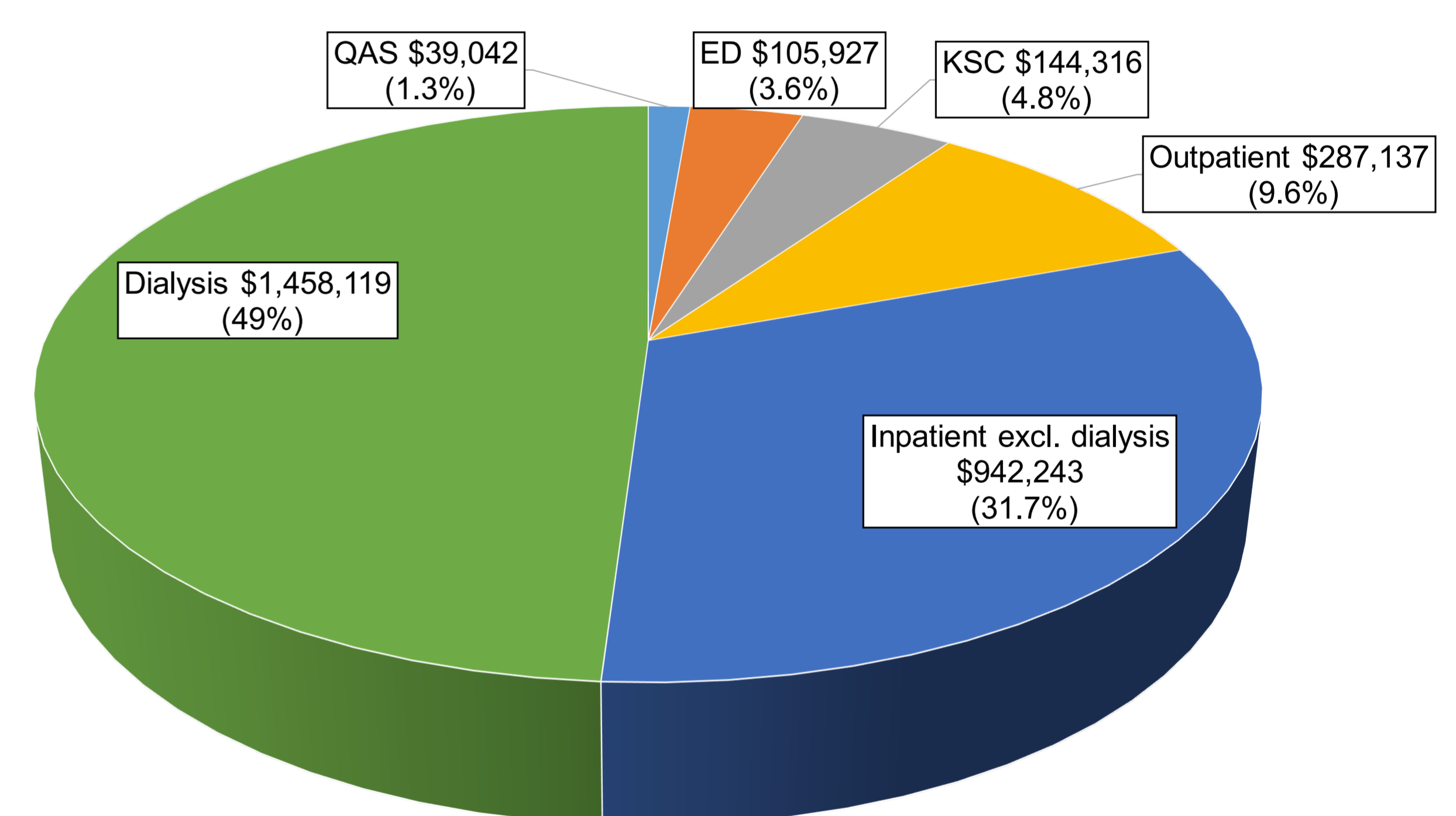**Figure 2: Healthcare expenditure recorded during the KSC program**

QAS $39,042 (1.3%)
ED $105,927 (3.6%)
KSC $144,316 (4.8%)
Outpatient $287,137 (9.6%)
Inpatient excl. dialysis $942,243 (31.7%)
Dialysis $1,458,119 (49%)

Table 2: Results of multivariate regression analyses

	Utilisation model (1)			Cost model (2)		
	Coef.	p	95% CI	Coef.	p	95% CI
male	0.059	0.664	-0.21 0.33	0.134	0.578	-0.34 0.61
age	0.005	0.325	-0.01 0.02	0.007	0.468	-0.01 0.02
diabetes	**0.323**	**0.040**	**0.02 0.63**	**0.835**	**0.005**	**0.26 1.41**
cvd	0.213	0.159	-0.08 0.51	-0.027	0.916	-0.54 0.49
dialysis_part	**0.993**	**0.000**	**0.67 1.32**	**1.456**	**0.000**	**0.87 2.04**
_full	**0.397**	**0.044**	**0.01 0.78**	0.306	0.270	-0.24 0.85
conservative	**0.323**	**0.023**	**0.05 0.60**	**0.572**	**0.028**	**0.06 1.08**
log_time	**-0.382**	**0.000**	**-0.53 -0.24**	**-0.604**	**0.000**	**-0.93 -0.28**
constant	0.198	0.697	-0.80 1.19	7.422	0.000	5.58 9.26
N	102			102		
Test stat*	76.37			7.02		
p-value	0.0000			0.0000		
R-squared^	11.6%			35.2%		

(1) Poisson model (contacts with health care for reasons other than dialysis)
(2) OLS with log-transformed outcome variable (costs of health care other than dialysis)
* Wald chi2(8) for model (1) and F(8, 93) for model (2)
^ In the case of model (1) reported is pseudo-R2