

Costs of pediatric kidney transplant

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Introduction

- Kidney transplant is the goal for treatment of children with ESRD due to beneficial effects on growth and development and improvements in quality of life.
- Kidney transplant is more effective than dialysis for treatment of ESRD.
- Kidney transplant in adults is more cost-effective than dialysis.
- Data on the costs of kidney transplant are plentiful for adults but limited for children.
- Differences between adult and pediatric kidney transplant recipients could impact economic benefits.

Methods

- Using SRTR standard analysis files linked to Medicare Part A and Part B cost data, we examined the cost of care for kidney transplant recipients aged <20 years with primary Medicare coverage.
- Kidney-pancreas transplant recipients were excluded.
- We report per-person per-year costs (PPPY, cost/years of observation), censored at loss of kidney function.
- Costs in the first posttransplant year are reported for 641 recipients who underwent transplant 2008-2009. Costs in the second posttransplant year are reported for 280 recipients who underwent transplant in 2008.

Results

- Pediatric transplant recipients with primary Medicare coverage were similar in age and sex to those with other coverage. Medicare-covered recipients were less likely than non-Medicare recipients to be white or have a living donor or undergo preemptive transplant. Diagnosis groups also varied by Medicare coverage status (Table 1).
- Pediatric transplant costs were \$20K PPPY higher than adult transplant costs in year 1, and \$6K higher in year 2 (SRTR ADR, 2013).
- Among all pediatric recipients, year-1 costs, \$102K PPPY, were higher than prevalent dialysis costs in 2008-2009, \$78K PPPY. Year-2 posttransplant costs, \$31K PPPY, were less than half the cost of dialysis in children, however.
- Year-1 and -2 costs varied by age at transplant. Among recipients aged 0-4 and 5-9 years, year-1 costs exceeded \$120K PPPY, while costs among older recipients were \$90K PPPY (Fig 1).
- Costs for recipients whose primary diagnosis was FSGS exceeded costs for those diagnosed with GN by \$42K PPPY in year 1 and \$4K PPPY in year 2. Costs among those with structural abnormalities were \$28K less in year 1 and \$14K less in year 2 than among those with FSGS (Fig 3).
- Costs of living donor transplants were lower than costs of deceased donor transplants in the first posttransplant year, but were the same in year 2 (Fig 4).
- Recipients with a history of dialysis cost over 50% more than those undergoing preemptive transplants in both the first and second posttransplant years (Fig 5).
- Year-1 costs among highly sensitized recipients, with 80% PRA or higher, were over \$40K PPPY more than among those with 0% PRA and \$21K to \$28K higher than among those with 1% to 79% PRA. Year-2 costs were more similar, but still lower among unsensitized patients.

Table 1: Baseline characteristics of pediatric kidney transplant recipients, 2008-2009

Characteristic	Level	Medicare-covered		Non-Medicare		P-value
		N	%	N	%	
Patients	All	641	100	1313	100	n/a
Age group	0-4	89	13.9	185	14.1	0.7741
	5-9	89	13.9	183	13.9	
	10-14	153	23.9	339	25.8	
	15-19	310	48.4	606	46.2	
Sex	Male	354	55.2	762	58.0	0.2389
	Female	287	44.8	551	42.0	
Race	White	290	45.2	724	55.1	<.0001
	Black	174	27.2	181	13.8	
	Hispanic	147	22.9	357	27.7	
	Asian	17	2.7	34	2.6	
	Other	13	2.0	17	1.3	
Diagnosis	FSGS	106	16.5	147	11.2	0.0003
	GN	99	15.4	153	11.8	
	Structural*	172	26.8	397	30.2	
	Other/Unk.	264	41.2	614	46.8	
	Living	173	27.0	617	47.0	<.0001
Donor type	Deceased	468	73.0	696	53.0	
	Preemptive Tx	61	9.5	472	36.0	<.0001
Pre-tx RRT	Dialysis	580	90.5	841	64.0	<.0001
	0%	464	72.4	945	72.0	<.0001
	1-19%	76	11.9	195	14.9	
	20-79%	54	8.4	86	6.6	
PRA	80-100%	39	6.1	39	3.0	

FSGS = focal segmental glomerulosclerosis
GN = glomerulosclerosis
RRT = renal replacement therapy
* Structural diagnoses include reflux nephropathy, obstructive uropathy, and dysplasia/hyposplasia/dysgenesis/agenesis.

Figure 1: PPPY Medicare costs (\$) among pediatric kidney transplant recipients, by age group (years)

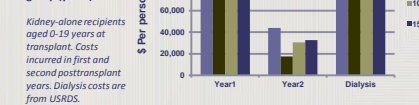


Figure 3: PPPY Medicare costs (\$) among pediatric kidney transplant recipients, by diagnosis

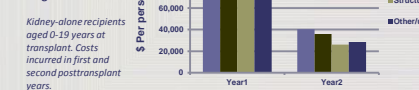


Figure 5: PPPY Medicare costs (\$) among pediatric kidney transplant recipients, by dialysis history

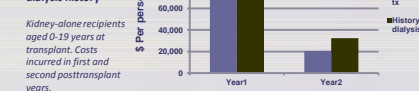


Figure 2: PPPY Medicare costs (\$) among pediatric kidney transplant recipients, by race group

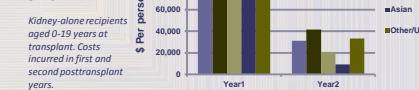


Figure 4: PPPY Medicare costs (\$) among pediatric kidney transplant recipients, by donor type



Figure 6: PPPY Medicare costs (\$) among pediatric kidney transplant recipients, by PRA



Conclusions

- Cost of pediatric kidney transplant care varies by recipient age, diagnosis, dialysis history, and PRA.
- While year-1 posttransplant costs were higher than prevalent dialysis costs in children, year-2 costs were dramatically lower, suggesting that pediatric transplant is cost saving compared with dialysis.