Background
Healthcare costs following kidney transplantation are hypothesized to be inversely associated with renal function. However, the magnitude of these relationships are not fully quantified for deceased donor kidney transplant recipients in the first year post-transplant.

Objectives
Describe relationships between total medical costs in the first year following deceased donor kidney transplant with overall renal function as measured by: 1) estimated glomerular filtration rate (eGFR) at different time points, and; 2) early graft failure.

Methods
The United States Renal Data System was used to identify adults receiving single-organ deceased donor kidney transplants 2012-2015. Recipients without Medicare as primary payer were excluded. Costs derived from Parts A and B claims including inpatient, emergency, outpatient, and skilled nursing facility costs. eGFRs were available at discharge, 6-months, and 12 months. Thus, eGFR relationships are described for several month-based time periods post-discharge: 0-3, 3-6, 6-12, and 3-12. For recipients with graft failure a time-history of medical costs was constructed with failure as the index date. Descriptive analyses were conducted. Monthly costs of those with graft failure in the first year post-transplant were compared to those without failure.

Results
The resulting cohort of deceased donor transplant recipients represents a total of 24,021 patients who experience a 2.4% graft failure rate in the first year post-transplant (Table 2). Those with graft failure have lower eGFR values at each of the 3 time points post-transplant and are more likely to be younger, assigned Black race, and have higher BMI.

Discussion
For those without graft failure in the first year following transplant, total medical costs exhibit strong trends with eGFR in the post-discharge period. In the 3-6 months post-discharge period, recipients with 6-month eGFRs of 30-59 mL/min/1.73m² have total costs 48% lower than those with <30 mL/min/1.73m². Both 6- and 12-month eGFRs correlate well with costs from 3 to 12 months post-discharge (Figure 1).

For recipients with graft failure monthly costs begin to rise 3-4 months prior to failure, with a spike of over $38,000 during the month of failure. Costs appear to stabilize 3-4 months post-failure suggesting a failure process that is several months long (Figure 2).

Compared to the monthly costs of patients without graft failure weighted for the month post-transplant, costs for those experiencing graft failure are higher at each month observed. Centering on the median month of failure, 6 months post-transplant, the incremental costs of graft failure are $153,397 in the first year.

Conclusions
Total medical costs in the first year post-transplant are strongly correlated with eGFR at various times post-discharge. Time histories of resource utilization exhibit strong associations with total monthly medical costs. The association between eGFR and costs is weaker for eGFR measured near discharge.