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"Kidney transplantation is cost effective compared with dialysis and improves quality of life. Expanded criteria donors (ECD) are defined as all deceased donors older than age 60 or donors between ages 50 and 59 who have two of the following three criteria: (1) a history of hypertension, (2) death caused by cerebrovascular accident (CVA), and (3) creatinine greater than 1.5 mg/dL at the time of procurement. ECDs have increased dramatically in the US in recent years. ECD kidneys accounted for 6% of kidneys transplanted from deceased donors in 1991 compared to 22% in 2009. Those patients receiving ECD kidneys experience more frequent need for post-operative dialysis, longer length of stay, more hospital readmission due to poor or late kidney function. ECD kidneys have 70% greater risk for failure compared with a standard criteria donor (SCD) kidney transplantation (relative hazard ratio 1.70). Survival of ECD kidneys is, on average, shorter than SCD kidneys for two general reasons: first, baseline renal function, estimation of glomerular filtration rate (eGFR), of these kidneys is likely to be lower; and, second, ECD kidneys tend to be transplanted into older recipients who have higher rates of post-transplant death. Thus the financial impact and long term benefits of transplanting these kidneys have been questioned.

There are three major concerns with increased ECD use. First, transplant programs are accepting higher risk deceased donor kidneys. The kidney donor risk index (14 donor and recipient factors independently associated with graft kidney failure or death) is being used to track changes in the risk profile of donors and the distribution of kidney donor risk score has been increasing over the past decade. Second, there is no recent cost effectiveness analysis on ECD kidney use in the current literature. An economic cost analysis was performed by Whiting et al. who studied United Network of Organ Sharing (UNOS) / United States Renal Database System (USRDS) and Medicare claims analysis between 1991 and 1996 to assess the economic impact of use of these kidneys. The break-even point with hemodialysis ranged from 4.4 years for SCD/ non high risk recipient pairings to 13 years for ECD/high risk recipient combinations. Third, there is a need in developing surrogate markers for long term outcomes for allograft survival and mortality. Chronic kidney disease (CKD) stages validated in the general population provide a useful framework for predicting outcomes after kidney transplantation. A practical example of surrogate marker is eGFR derived from Modification of Diet in Renal Disease (MDRD) equation.[14] Kasiske et al. showed that eGFR at 12 months was associated strongly with subsequent graft failure, death-censored graft failure, and death with functioning graft during 10 years post-transplant follow-up.

Using unique existing dataset including data from Columbia University Medical Center (CUMC) and USRDS, we will study predictors of ECD kidney failures, eGFR at 12 months post-transplant as a surrogate marker for ECD kidney outcomes and conduct a cost effectiveness analysis of ECD compared with dialysis. Findings of this study have the potential to improve clinical outcomes for kidney transplant recipients and better utilization of ECDs and provide pilot data for future research projects."