# Trends in racial disparities in graft failure rates in the U.S. pediatric kidney transplant population, 1980-2004

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## Introduction

- Adult African American kidney transplant recipients have consistently had lower graft survival compared to whites from 1980 to 2003 (Figures 1 & 2; Ref: USRDS 2007 Atlas of End-Stage Renal Disease, Tables F.1-F.12).
- We examined trends in racial disparities for graft failure rates in pediatric (age <20), first-kidney transplant recipients between 1980 and 2004.

## Methods

- White and African American first-kidney transplant recipients, 1980-2004, aged younger than 20 at the time of transplant (N=16,019).
- We analyzed trends in one-year graft failure rates for all recipients, and graft failure rates during years 2-5 for recipients whose grafts survived the first year.
- Trends were analyzed in five-year intervals to improve the stability of rate estimates.

## Methods, *continued*

- A Poisson regression model was used to estimate graft failure rates by era and race, (white vs. African American), with adjustment for ages (<4, 5-9, 10-14, 15-19), gender, donor type, and primary cause of renal failure (glomerulonephritis vs. other).
- Rates were standardized to the characteristics of the 2000-2004 pediatric transplant population to facilitate comparisons across time.

## Study Population

| Characteristic | White (N=12,963) | Row % | African American (N=3,656) | Row % |
|---|---|---|---|---|
| Transplant Year | | | | |
| 1980-1984 | 2,070 | 85% | 361 | 15% |
| 1985-1989 | 2,846 | 82% | 617 | 18% |
| 1990-1994 | 2,731 | 80% | 662 | 20% |
| 1995-1999 | 2,902 | 79% | 785 | 21% |
| 2000-2004 | 2,414 | 79% | 631 | 21% |
| Age at Transplant | | | | |
| < 1 year | 140 | 95% | 8 | 5% |
| 1-4 | 1,749 | 86% | 290 | 14% |
| 5-9 | 2,174 | 82% | 480 | 18% |
| 10-14 | 3,791 | 82% | 845 | 18% |
| 15-19 | 5,109 | 78% | 1,433 | 22% |
| Donor Type | | | | |
| Deceased | 6,102 | 76% | 1,953 | 24% |
| Living | 6,861 | 86% | 1,103 | 14% |
| Gender | | | | |
| Female | 5,425 | 82% | 1,174 | 18% |
| Male | 7,538 | 80% | 1,882 | 20% |
| Primary Cause of ESRD | | | | |
| DM | 86 | 83% | 18 | 17% |
| HTN | 367 | 67% | 184 | 33% |
| GN | 3,654 | 75% | 1,194 | 25% |
| CKD | 875 | 92% | 76 | 8% |
| Other | 7,981 | 83% | 1,584 | 17% |
| Preemptive Transplant | | | | |
| Yes | 2,721 | 87% | 392 | 13% |

## Results

- The proportion of African American pediatric recipients increased over the time period of the study (Study population Table, p<0.0001).
- African American recipients were more likely to receive a deceased donor kidney and were less likely to be transplanted preemptively (Study population table, p<0.0001).
- One-year graft failure rates have declined considerably for both white and African American pediatric patients over the 25-year period; a decline of 73% for whites and 76% for African Americans (Figure 5).
- The rate of graft failure in the first year post-transplant was 30-60% higher in the African American population in all eras except 1990-1994 (Figure 7).
- Trends in the conditional 2-5 year graft failure rates also declined over the 25-year period; a 53% decline for whites and a 39% decline for African Americans (Figure 6).
- The rate of graft failure at 2-5 years in African Americans was approximately twice that of white recipients over the entire study period (Figure 8).

Figure 1. Graft survival probabilities
*Deceased donor recipients, all ages, unadjusted*
*(Ref: USRDS 2007 Annual Data Report, Tables F .2, F.5, & F.6)*

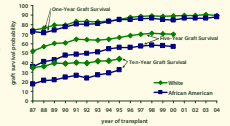



Figure 2. Graft survival probabilities
*Living donor recipients, all ages, unadjusted*
*(Ref: USRDS 2007 Annual Data Report, Tables F. 8, F.11, & F.12)*

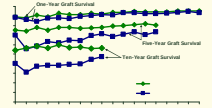



Figure 3. Transplant recipients included in the analysis
*By race*

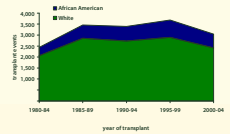



Figure 4. Transplant recipients included in the analysis
*By age at transplant*

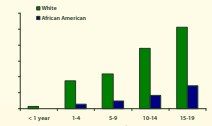



Figure 5. Adjusted one-year graft failure rates
*Per 100 patient-years*
*Adjusted for age, gender, donor type, & cause of renal failure.*

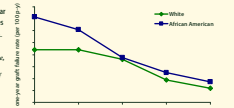



Figure 6. Adjusted conditional graft failure rates, years 2 through 5
*Conditional on first-year graft survival. Per 100 patient-years*
*Adjusted for age, gender, donor type, & cause of renal failure.*

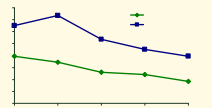


Figure 7. Relative risk of one-year graft failure
*Adjusted for age, gender, donor type, & cause of renal failure.*

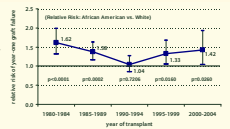
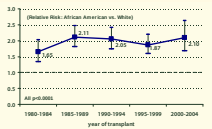



Figure 8. Relative risk of graft failure conditional on one-year graft survival
*Estimated from years 2-5.*
*Adjusted for age, gender, donor type, & cause of renal failure.*




## Conclusion

- While pediatric graft failure rates have shown improvement over the 25-year period of time, African American pediatric kidney transplant recipients continue to have poorer graft survival rates compared with white patients across eras despite medical progress.

## Discussion

- Potential measures that might close the gap in outcomes between white and African American pediatric recipients, including increased frequency of preemptive and living donor grafts in African American recipients and new immunosuppression protocols, merit further study.

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