Current Status in Racial/Ethnic Disparities in Kidney Transplantation after the Implementation of the New Allocation System

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Disclosures:

- Nothing to Disclose
Racial and Ethnic Minorities Will Comprise Almost Half of the Total Population by 2050

Figure 2
Distribution of the U.S. population by race/ethnicity, 2000 and 2050

NOTE: "Other" includes non-Latino individuals who reported "Some other race" or "Two or more races." Data for 2050 do not include estimates for the "Other" category.


Older African Americans and Latinos are More Likely to Have Chronic Conditions

Figure 1
Proportion of adults age 50 and older with chronic conditions: by race/ethnicity


Racial and Ethnic Minorities are Less Likely to Have a Regular Doctor and Health Insurance

Figure 3a
Proportion of the nonelderly population who do not have a usual source of care, by race/ethnicity

Figure 3b
Proportion of the nonelderly population who are uninsured, by race/ethnicity

Trends in standardized ESRD incidence rate, by race, in the U.S. population, 2000-2016

Number of deceased-donor transplants and unadjusted transplant rates among deceased-donor kidney recipients, by recipient race, 1999-2016

Data Source: Special analyses, USRDS ESRD Database. Standardized to the age-sex distribution of the 2011 US population. Special analyses exclude unknown age, sex, and unknown/other race. Abbreviations; AI/AN: American Indian/Alaska Native; NH/PI: ESRD, end-stage renal disease.

2018 Annual Data Report
Volume 2 ESRD, Chapter 1
Conclusion:

Adults who received a first kidney-only transplant in the United States from 1990 to 2012, blacks experienced greater improvements in all-cause graft loss than whites, which translated into a statistically significant reduction in the disparity in graft survival.
Despite improvement in outcomes...

- lower likelihood of being placed on the kidney transplant waitlist compared with whites.
- longer times on dialysis on average before being referred for transplantation
- 90% of all patients with ESKD in the United States are initiated on dialysis
- More than one quarter of dialysis facilities have a significant racial disparity in the proportion of black versus white patients with ESKD who are waitlisted for transplant.
- less likely to have received adequate transplant education
- lower transplant knowledge
- less willing to allow a living donor

Patients age 18 & older listed for a first-time, kidney-only transplant in the given year

USRDS 2010
Change in Allocation

First Come, First Serve

- Listed at the moment of acceptance
- Unintentional disparities in access for minority candidates on the waiting list: late referral from transplantation

New Allocation

- Credit for the years on dialysis
- Promotes preemptive transplantation
- Improved access to transplantation to highly sensitized recipients
- Increase access to kidney transplants for blood group B recipients who are principally ethnic minorities
What has worked?

*Note: The most recent two months of dialysis data is set to missing due to OPTN data collection lags.*
OPTN/SRTR 2017 Annual Data Report
KIDNEY TRANSPLANTS BY ETHNICITY
Deceased Donor Kidney Alone Transplants by Recipient Ethnicity

OPTN data as of Jan. 23, 2019.
How do changes in a patient’s kidney transplant wait-list status impact their chances of getting a transplant?
Predicted Transplant Probabilities by Calculated Panel Reactive Antibody (cPRA)
For Patients initially listed as active

- Whites have significant advantage in transplant probability over black individuals in cPRA categories of 80% to 89% and 90% or more

- Hispanic individuals had a statistically significant advantage over black individuals in the cPRA group of 90% or more but not at a cPRA of 80% to 89%

- Once inactive, blacks would be less likely to resolve issues that brought them to inactive status
Increase access to kidney transplants for blood group B recipients:
Biology Influence on Organ Distribution

Patients age 18 & older listed for a first-time, kidney-only transplant in the given year

USRDS 2010

Minority Composition by Blood Type (2013)

Race Composition of Blood Type B Candidates (2013)

Am J Transplant 2015; 16: 11-20
Increase access to kidney transplants for blood group B recipients:

- Organ Procurement and Transplantation Network [OPTN]/United Network for Organ Sharing [UNOS] Policy 8):
  - Allocated group B deceased donor kidneys were directed away from AB candidates to blood group B candidates (except for 0 HLA mismatches).

Results:

- B candidates received 10% more kidney transplants in the 12-year period since the KAS was changed (2001–2013) than in the 12-year period (1989–2001) before the change.
Increase access to kidney transplants for blood group B recipients:

- Organ Procurement and Transplantation Network [OPTN] Minority Affairs Committee: National Prospective Variance of Practice
  - 8 participating DSA’s
  - Allocated group B deceased donor with anti-IgG titers < 1:8
  - 111 A2/A2B to B transplants

Results:
- Similar survival between A2/A2B to B recipients vs B to B recipients.
- Transplant rates for A and AB blood types although lower, still higher than the wait list composition
- Increased transplantation rates for minorities.
Impact of the new kidney allocation system A2/A2B → B policy on access to transplantation among minority candidates

Deceased Donor non-A1/non-A1B to B Kidney Transplants by Month
(December 1, 2013 - September 30, 2018)

Pre-KAS (N=14)
Post-KAS (N=53)

A2, A2B Donors among Type B Recipients

OBM Transplantation 2019;3(1)
Impact of the new kidney allocation system A2/A2B → B policy on access to transplantation among minority candidates

• increase in the utilization of A2/A2B kidneys in the post-KAS period from 1.95% of blood group B recipient DDKT pre-KAS and increasing to 8.93% post-KAS.

• Most of the recipients are male, shorter duration of dialysis, and older than 55 years

• use of A2i DDKT was more commonly reserved for patients with zero-HLA mismatch and less likely to be utilized among highly sensitized patients.

Meeting Expectations?

• National blood group B transplantation rate expected to improve from 9% to 34%.*

• 18 month KAS post-implementation:
  – 82% of transplant programs do not perform any non-A1/non-A1B (A2/A2B) transplants
  – many programs cited a difficulty in establishing a protocol for patient enrollment as the major barrier to performing these transplants
    • Difficulty establishing titer thresholds (32 percent)
    • Difficulty developing an informed consent policy (21 percent)
    • Difficulty determining patient eligibility (18 percent)
  – modest financial investment at start-up followed by ongoing expense for each candidate.
  – changes may not have been as great as what had previously been appreciated following the prior variance of practice in 2002

* Based on Data from Midwest Transplant Network and OPTN/UNOS voluntary variance
### Impact of the new kidney allocation system A2/A2B → B policy on access to transplantation among minority candidates

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Pre-KAS (01/01/2013-12/03/2014)</th>
<th>Post-KAS (12/04/2014-02/28/2017)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OR (95% CI)</td>
<td>aOR (95% CI)</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>1.0 (ref)</td>
<td>1.0 (ref)</td>
</tr>
<tr>
<td>Black</td>
<td>0.67 (0.36-1.25)</td>
<td>0.73 (0.37-1.43)</td>
</tr>
<tr>
<td>Asian</td>
<td>1.24 (0.57-2.67)</td>
<td>1.41 (0.63-3.19)</td>
</tr>
<tr>
<td>Other</td>
<td>1.31 (0.17-10.0)</td>
<td>1.25 (0.16-9.67)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>1.17 (0.53-2.62)</td>
<td>1.03 (0.43-2.48)</td>
</tr>
</tbody>
</table>

Summary:

• Improving short and intermediate outcomes for minorities prior to the KAS Implementation.

• Causes for racial disparities are multifactorial, and not completely solved.

• Improvement in racial disparities with improvement in transplantation rates for minorities.

• Policy improvements, in general, have been beneficial for minorities.

• Resolution of disparities is still a work in progress.
Other Important Issues to Consider

• **Apol -1 variants:** Potential effects in racial disparities.

• **Geographic Disparities** as a primary driver in variation to transplant rates.

• **Medicaid expansion:**

![Map of Medicaid Expansion in 2016](image)

<table>
<thead>
<tr>
<th>Status of State Medicaid Expansion in 2016</th>
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<tbody>
<tr>
<td>Medicaid Expansion States (N=24+DC)</td>
</tr>
<tr>
<td>Expanded (17)</td>
</tr>
<tr>
<td>Not expanded (10)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Number of Preemptive Listings Covered by Medicaid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medicaid Expansion States (N=24+DC)</td>
<td>Pre Expansion Period (2011-2013)</td>
</tr>
<tr>
<td>Expanded States</td>
<td>1094</td>
</tr>
<tr>
<td>Not expanded States</td>
<td>59%</td>
</tr>
<tr>
<td>Expanded States</td>
<td>1737</td>
</tr>
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<td>Not expanded States</td>
<td>p&lt; 0.001</td>
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</table>

Association Between Medicaid Expansion Under the Affordable Care Act and Preemptive Listings for Kidney Transplantation
Other Important Issues to Consider

• Lack of Awareness of racial Disparities as well as the New Allocation System among Health Care Providers in Dialysis Facilities.

• Transplant Immunosuppressive Coverage
Questions?
APOL-1 Variants:

A) APOL1 G1 risk model

<table>
<thead>
<tr>
<th></th>
<th>G0/G0</th>
<th>G0/G1</th>
<th>G1/G1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic kidney disease</td>
<td></td>
<td><img src="image" alt="Risk (CKD)" /></td>
<td><img src="image" alt="Risk (CKD)" /></td>
</tr>
<tr>
<td>T.b. rhodesiense</td>
<td></td>
<td><img src="image" alt="Risk (infection)" /></td>
<td><img src="image" alt="Risk (infection)" /></td>
</tr>
<tr>
<td>T.b. gambiensis</td>
<td></td>
<td><img src="image" alt="Risk (severe HAT)" /></td>
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B) HAT endemicity

C) APOL1 G1 allele distribution

D) APOL1 G2 allele distribution

APOL1 variants increase the risk of chronic kidney disease

- Individuals with 2 normal copies of APOL1 can be infected by the parasite.
- Having 1 variant allele confers protection against trypanosomiasis without leading to kidney disease.
- Having 2 variant alleles confers protection against trypanosomiasis but increases the risk of chronic kidney disease (CKD).
Could we inadvertently be promulgating another racial disparity in health outcomes by the absence of a fuller understanding of this biology?

- genetic contribution to ESRD risk
- genetic variants at the \textit{APOL1}: G1 and G2
  - account for most of the excess risk of ESRD among blacks, whose risk of ESRD is 3.3 times that of whites
  - black KT recipients who are homozygous for the G1 and G2 \textit{APOL1} gene variants also have earlier allograft failure than individuals who are wild type or heterozygous at these loci.
- predispose black individuals with that genomic signature to increased risk for nondiabetic CKD
  - segregating in the black population, have an outsized influence on long-term KT longevity,
- potent influence on KT allograft outcomes after both live and deceased donation from blacks as well as on long-term black LD kidney health outcomes.
Conclusion:
Among a limited sample of dialysis facilities with low waitlisting, provider awareness of racial disparities in kidney transplant waitlisting was low, particularly among staff who may have more routine contact with patients.
The ASCENT (Allocation System Changes for Equity in Kidney Transplantation) Study: A Randomized Effectiveness-Implementation Study to Improve Kidney Transplant Waitlisting and Reduce Racial Disparity

- educational webinar for dialysis medical directors
- educational video for patients and dialysis staff
- dialysis facility-specific transplantation performance feedback report

- ✓ Health literacy instruments for kidney recipients
- ✓ Transplant self care
- ✓ Benefit of transplantation
- ✓ Gaining access to transplantation
Improve Access to Transplantation

- Geographic Disparities
- Access to Transplantation
- Medication Coverage
Improve Access to Transplantation

- Geographic Disparities
Geographic disparities

The geographic location of the transplant hospital (assessed by the hospital’s donation service area, or DSA) remains a primary driver in variation to transplant rates – a 17-fold difference from the DSAs with the highest and lowest transplant rates.

The OPTN is currently working to improve geographic disparities in access to transplantation.
Improve Access to Transplantation

• Access to Transplantation
vol 1 Figure 1.14 Estimated prevalence of self-reported kidney disease by state, BRFSS participants ages 18 and older (d) 2016

Data source: Behavioral Risk Factors Surveillance System (BRFSS), participants aged 18 & older. 2013 (N=491,777), 2014 (N=464,617), 2015 (N=441,460), and 2016 (N=486,303).

vol 2 Figure 6.9 Geographic distribution of unadjusted transplant rate by state, 2016

Status of State Medicaid Expansion in 2016

- Expanded (32)
- Not expanded (19)

CENTER ON BUDGET AND POLICY PRIORITIES I CBPP.ORG
Did Medicaid Expansion Influence Trends in Medicaid-Covered Preemptive Listings for Kidney Transplantation?

### Outcomes

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<td><strong>p&lt;0.001</strong></td>
</tr>
<tr>
<td>Medicaid Non Expansion states (N=19)</td>
<td>330</td>
</tr>
<tr>
<td>330</td>
<td>359</td>
</tr>
<tr>
<td><strong>8.8%</strong></td>
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Association Between Medicaid Expansion Under the Affordable Care Act and Preemptive Listings for Kidney Transplantation

Meera N. Harhay et al. CJASN 2018;13:1069-1078
Improve Access to Transplantation

- Prescription Drug Coverage
Medication Coverage

- The association between loss of Medicare, immunosuppressive medication use, and kidney transplant outcomes

<table>
<thead>
<tr>
<th>Timing of Medicare loss, months posttransplant</th>
<th>Hazard ratio (95% confidence interval)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-6</td>
<td>10.94 (8.19-14.63)</td>
</tr>
<tr>
<td>7-12</td>
<td>15.18 (10.64-21.67)</td>
</tr>
<tr>
<td>13-24</td>
<td>17.33 (12.74-23.56)</td>
</tr>
<tr>
<td>25-36</td>
<td>12.42 (8.99-17.16)</td>
</tr>
<tr>
<td>37-38</td>
<td>0.99 (0.91-1.07)</td>
</tr>
<tr>
<td>39-48</td>
<td>2.42 (1.94-3.03)</td>
</tr>
<tr>
<td>49-60</td>
<td>2.72 (1.80-4.10)</td>
</tr>
<tr>
<td>61-72</td>
<td>8.38 (3.63-19.34)</td>
</tr>
</tbody>
</table>


The risk of early Medicare loss was nearly 40% higher for African American than for white recipients.
Since the Implementation of the New Allocation System:

- Minorities have had access to transplantation
- Transplantation rates have improved
- Highly sensitized black patients still have problems getting access to a kidney transplant