Increasing Kidneys for Transplantation: Decreasing Discards

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Professor of Surgery
Georgetown University School of Medicine
Board of Directors, National Kidney Foundation
I have no conflicts of interest
I have no conflicts of interest

am, however, incredibly conflicted with the U.S. Organ Discard Rate......
Growing Incidence of ESRD

Data Source: Reference Table D.1. Abbreviation: ESRD, end-stage renal disease.

Knowledge and Compassion Focused on You
Growing Incidence of ESRD

Data Source: Reference Table D.1. Abbreviation: ESRD, end-stage renal disease.
The Growing Waiting List

**94,915 as of 4/11/19**
Kidney Transplant Totals

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Transplant is the preferred option
All cause mortality among Medicare beneficiaries

Prevalent ESRD patients from day one, 2011, USRDS 2013 ADR Figure 5.2
5 year survival rates for ESRD by modality

- Dialysis
- Peritoneal Dialysis
- Hemodialysis
- Deceased Donor Transplant
- Living Donor Transplant

2000: 35, 353766
2002: 36, 364269
2004: 38, 374670
2006: 40, 394772
2008: [VALUE], 405075

2016 USRDS ADR Table 6.1
The Rising Deceased Donor Kidney Discard Rate in the U.S.

3159 kidneys were discarded in 2015

Stewart, D. Transplantation 2017; 101(3):575-587
NKF Consensus Conference to Decrease Kidney Discards
May 18-19, 2017

Conference Co-Chairs:
Matthew Cooper, MD
Stephen Pastan, MD

Special thanks to our sponsors:
NKF Consensus Conference to Decrease Kidney Discards

Baltimore, MD

**Over 65 participants representing:**

- Kidney patients and families
- Transplant surgeons and nephrologists
- Organ procurement organization (OPO) leadership
- Federal government
  - Centers for Medicare and Medicaid Services (CMS)
  - Health Resources and Services Administration (HRSA)
  - National Institutes of Health (NIAID/NIDDK)
- American Society of Transplantation (AST)
- American Society of Transplant Surgeons (ASTS)
- United Network for Organ Sharing (UNOS)
- Scientific Registry of Transplant Recipients (SRTR)
- Payers
NKF Consensus Conference to Decrease Kidney Discards

**Work Groups:**

1. **Donor Evaluation and Procurement**
   - Work Group Co-Chairs: Ryutaro Hirose, Kevin O’Connor

2. **Recipient Selection and Allocation**
   - Work Group Co-Chairs: Richard Formica, John Friedewald

3. **Education and Research**
   - Work Group Co-Chairs: Sumit Mohan, Jesse Schold
Work Group 1: Donor Evaluation and Procurement

**Co-Chairs:** Ryutaro Hirose, Kevin O’Connor

**Participants:**
- David Adam Axelrod
- Ginny Bumgardner
- Kevin Cmunt
- Renee F. Dupee
- Elling Eidbo
- Richard Hasz
- Nichole Jefferson
- Bertram Kasiske
- Kevin A. Myer
- Howard M. Nathan
- Richard V. Perez
- John D. Rosendale
- Lainie Friedman Ross
- Peter G. Stock
- Sean Van Slyck
- Dennis C Wagner
Objective – Work Group 1

- Help more patients by increasing the number of deceased donor kidneys transplanted
  \[ \text{# kidneys tx'd} = (\text{# donors} \times 2) - (\text{# kidneys not recovered}) - (\text{# recovered kidneys discarded}) \]
- Three strategic categories:
  - Increase donors
  - Increase kidney recovery from donors
  - Decrease kidney discards
Objective – Work Group 1

- Help more patients by increasing the number of deceased donor kidneys transplanted
  - \# kidneys tx’d = (\# donors x 2) – (\# kidneys not recovered) – (\# recovered kidneys discarded)
- Three strategic categories:
  - Increase donors
  - Increase kidney recovery from donors
  - Decrease kidney discards
Wide Variation in Kidney Utilization

kidneys tx’d = (# donors x2) – (# kidneys not recovered) – (# recovered kidneys discarded)

OPO A (2015 & 2016: 340 donors)
680 – 89 – 195 = 396  (58% utilization)

209 donors
418 – 17 – 34 = 367  (88% utilization)
Kidney Donor Profile Index (KDPI)

**KDPI Variables**

- Donor age
- Height
- Weight
- Ethnicity
- History of Hypertension
- History of Diabetes
- Cause of Death
- Serum Creatinine
- HCV Status
- DCD Status

The pathologic findings are NOT included in KDPI
Graft Survival & Discard Rates by KDPI

Gradual decline in graft survival, yet steep increases in kidney discard rates

Source: Darren Stewart, UNOS Research
Impact of KDPI Labeling on Kidney Discard

- Pre KAS
- Post KAS

0-20:
- Pre KAS: 2.3%
- Post KAS: 2.2%

21-34:
- Pre KAS: 6.4%
- Post KAS: 6.2%

35-85:
- Pre KAS: 17.0%
- Post KAS: 18.7%

86-100:
- Pre KAS: 54.8%
- Post KAS: 58.7%

Overall:
- Pre KAS: 18.5%
- Post KAS: 19.8%
Graft outcomes with even the lowest quality kidneys exceed average dialysis patient survival

Donor reference population: All deceased kidney donors recovered for transplant in 2016. Based on OPTN data including primary, adult, deceased donor, kidney alone transplants, as of April 20, 2018.

https://www.usrds.org/2017/view/v2_05.aspx
The Donor Kidney Biopsy

- Needle
- Procurement
- Wedge
- Implantation
More History than Science??

“Moreover, graft loss occurred in 7% of recipients of kidneys with less than 20% and 38% with >20% sclerosis (P<0.04).”
Kidney Biopsy and Discard Rates over Time

% Procured Kidneys

- Biopsy
- Discard

2005 - 2018
Zero-Time Renal Transplant Biopsies: A Comprehensive Review

• Zero-time biopsies are valuable for ... research ... and as baseline for comparison with post-transplant histology.

• The predictive performance of individual lesions and of composite scores for post-transplant outcome is at best moderate.

• No histological lesion or composite score is sufficiently robust to be included in algorithms for discard.

M Naesens. *Transplantation* 2016; 100:1425
Zero-Time Renal Transplant Biopsies: A Comprehensive Review

• Association of 10 biopsy score formulas with post-transplant graft survival:
  – 5 judged to be poor
  – 3 judged to be unclear or not evaluated
  – 1 “moderate at best”
  – 1 moderate

M Naesens. Transplantation 2016; 100: 1425
Practice Change

• Biopsy practices (short term)
  • Reduce/eliminate clinically irrelevant biopsies
  • Jointly establish protocols to reach reasonable guidelines
  • Create local DSA based approval process (Biopsy criteria)
  • Example: No biopsy if:
    • Age < 60
    • Serum Cr < 2.0
    • KDPI < 85%
    • (exception: CMO approval upon request)
  • Disseminate background information/recommendations to community (not just transplant professionals)

• Proposed biopsy study: RCT of deceased donor kidney biopsies
Practice Change

- Pulsatile preservation of kidneys
- Establish effective kidney perfusion protocols
  - Pump criteria
    - Example: DCD
    - KDPI > 85%
    - Terminal Cr > 2.0
    - AKI
    - CMO exception
Logistics of Pumping

• Logistical practices
• Pump location
• Transport kidneys on pump across DSA boundaries
• Optimize OR timing for commercial flights
• Pump kidneys when extended CIT is anticipated
Practice Change
Minimizing Mandatory Share Discards

• Always have a Plan ‘B’
  • Backup all high-KDPI and high-CPRA kidneys locally
• Grant local backup to national centers
  • CIT increases significantly when no backup (17.9 vs 25.6 hrs)\(^1\)
• Machine perfusion to mitigate timing challenges \(^1,2\)
• Send peripheral blood early for crossmatching in advance (3 programs)
  • Added cost (~$1000/donor)
• Encourage infrastructure to allow for more virtual xmatch

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\(^1\) Paramesh et al. OPO Strategies to Prevent Unintended Use of Kidneys Exported for High PRA (>98% cPRA) Recipients. Am J Transplant; doi: 10.1111/ajt.14220
Practice Change

- Strengthen OPO-Transplant Center relationships
  - Utilization feedback using UNOS OPO reports to review acceptance and discard behaviors
  - Use new tools developed by SRTR for joint review of clinical activity, acceptance practices, etc.

Review All Local Offers to assure no opportunity missed!
<table>
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<th>ORGAN</th>
<th>Side</th>
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<th>DCGU</th>
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Admit/History:
Pt's A/A transfer with PMHS of newly diagnosed L portal tumor slip cyanotic and resection on 3/12, exercise induced asthma, anxiety, and depression who presented initially on 3/10 with an episode of difficulty with speech production and difficulty understanding what she was saying. Pt was transferred to floor after left portal tumor slip resection of lesion. Pt was subsequently emergently intubated given 23% hypotension saline push, and an EVD was placed at bedside. Neuro was consulted for concern for coagulopathy and the pt was given Vitamin K and transfused 2 units FFP. Factor VIII, IX, XI activity levels were sent. Discussion was had with family and Neuro at bedside. Pt declined Brain Dead on 03/13 @ 124 based on clinical and amnesia exams. "Pt will be considered OPO increased risk due to pt's brain tumor being diagnosed as either an anaplastic dopoganglioma or anaplastic astrocytoma, differential pending molecular analysis later this week. Prelim report attached to documents. "Exercise induced asthma and light cases of asthma when she was a child, used inhaler prior to strenuous workouts. "Noted in chart: undiagnosed factor XI deficiency."
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**Biopsy**
- RT: Glomeruli sclerosis 20% Kidney interstitial fibrosis/inflammation: absent Kidney arterial sclerosis: yes 26-50%.
- LT: Glomeruli sclerosis 26% Kidney interstitial fibrosis/inflammation: absent Kidney arterial sclerosis: yes 26-50%.

**Admit/History**
- Meyo/FW with PMTc: HTN. Last known ~2130 evening of 4/17. She was noted to be absent from work morning 4/18. She was found down by EMS and given Narcan for suspected overdose due to "pinpoint pupils" but did not respond. She was brought to SOMD where she was intubated and stat CTM showed diffuse SAH concentrating in the left ambient/interpeduncular/suprasellar cistern with a small intraventricular blood and dilatation of the temporal horns and 4th ventricle. She was transferred to DCGU for further management. (CP14 after EVD was inserted in ICU previously ICP was 38). At time of referral, patient is GCS3, no sedation; PERR, sluggish 4mm + cough, no gag. Family are aware of prognosis. PI pronounced DO at 1214 on 4/19/2018 via clinical exam and apneic test where CO2 rose from 41 to 70.

**Authorization**
- 4/20/2018 11:37
- Allocation Huddle: 4/20/2018 14:19
- Start of Kidney Allocation: 4/20/2018 14:42
- Enter OR: 4/21/2018 0:29
- Cross Clamp: 4/21/2018 3:10
- KDPI: 80%
Recovery and Usage Maps (RUM) Report

The Recovery and Usage Maps (RUM) Report is an interactive Tableau dashboard that provides detailed information regarding the recovery and transplantation of deceased donor organs (Phase 1 – Kidney). The Recovery map displays DSA level recovery/transplant information based on user selected donor characteristics. The Usage map displays which transplant centers are transplanting the organs from the types of donors the user selected.
Practice Change

PHS Increased Risk kidneys

- PHS increased-risk donors (IRDs) are almost 20% of the donor pool
- Discard rates higher for IRDs than non-IRD counterparts
- Wasteful to discard these: there should be someone on the list who would benefit
- Apply evidence-based decision support to accept
- Patients need clear information about risk/benefit of IRD kidney compared to dialysis

Transplantation is NOT risk-free \(\rightarrow\) limitations of Behavioral Health, Assessment from next of kin, etc.
Center acceptance behaviors

• Identify centers seeking growth

• Can’t assume all centers seeking growth

• Capitalize on forthcoming acceptance behavior reports coming from SRTR and make changes to allocation

• May change reliance on the “OPO Expedited Placement List”

• OPO Subcommittee → Expedited Placement Workgroup
Long Term Change: Economic Factors

• Reduce economic disincentives
  • Adjustment of SAC costs by kidney quality
  • Should there be some ‘reward’ for accepting kidneys likely to be discarded

• Revision of payment for renal transplant
  • Develop DRG with and without complications (or high risk for discard) for renal transplant
  • Carve out biologic agents from DRG/Global Payments

• Disseminate best practices for efficient use of high risk organs
  • Dual Kidney Transplantation / Peds En-bloc Transplantation
  • Early discharge to outpatient dialysis
  • Centers of Excellence for High Risk for Discard Organs
Finances of ECD and Non-ECD kidney transplants

- Reimbursements (Non-ECD)
- Reimbursements (ECD)
- Costs (ECDs)
- Costs (Non-ECDs)
- Margin (Non - ECD)
- Margin (ECD)

June 21, 2019

Knowledge and Compassion Focused on You
Current Kidney Allocation Considerations

- Demographic characteristics
  - Aging of the population
  - Greater burden of comorbidities
  - Extended time on the waiting list
- Allocation reform
  - Kidney allocation which prioritizes patients with increased allosensitization and long dialysis time
- Geographic variation
  - Unique to transplant reflecting donor supply and patient demand misalignment
## Economic Considerations - Recipient

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## Economic Considerations - Recipient

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### Working at Transplant

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### Economic Considerations - Donor

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<td>0.04</td>
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<tr>
<td>Donation after Cardiac Death</td>
<td>$6,182</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Cause of death</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anoxic Injury</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>Cerebrovascular Accident</td>
<td>-$3,040</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Head Trauma</td>
<td>-$2,322</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>CNS Tumor</td>
<td>-$980</td>
<td>0.71</td>
</tr>
<tr>
<td>Other</td>
<td>-$1,618</td>
<td>0.17</td>
</tr>
<tr>
<td>HLA o Mismatch</td>
<td>-$4,332</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>HLA o-DR Mismatch</td>
<td>-$2,968</td>
<td>&lt;.0001</td>
</tr>
</tbody>
</table>
Adult Dual Unilateral Kidney Transplant (DUKT) – High KDPI Donors
Adult Dual Unilateral Kidney Transplant (DUKT) – High KDPI Donors
Pediatric En-bloc Kidneys
Pediatric En-bloc Kidneys
RESULTS: Of 516 deceased donor kidney transplants, 29 were DKT and 487 were SKT. Mean follow-up was 43 ± 67 months. DKT recipients were older and more likely than SKT recipients to receive an extended criteria graft (p < 0.001). For DKT versus SKT, the rates of delayed graft function (10.3 versus 9.2%) and acute rejection (20.7 versus 22.4%) were equivalent (p = ns). A higher than expected urologic complication rate in the DKT cohort (14 versus 2%, p < 0.01) was reduced through modification of the ureteral anastomosis. Graft survival was equivalent between DKT and SKT groups (p = ns) with actuarial 3-year DKT patient and graft survivals of 100% and 93%. At 3 years, the groups had similar renal function (p = ns).
Long Term Change: Technology & Innovation

• Warm perfusion
• Device development
• Centralized organ recovery suites → Less travel
• Centralized infectious disease testing labs
Work Group 2: Recipient Selection and Allocation

Co-Chairs: Richard Formica, John Friedewald

- Mark Aeder
- Adam Bingaman
- Gabriel M. Danovitch
- Jon Friedman
- Howard M. Gebel
- Sharon Klarman
- David Klassen
- Daniela Ladner
- Allan Massie
- Jennifer E. Milton
- Charles Modlin
- Cathi Murphey
- Emilio D. Poggio
- Fiona Portington
- Luke Prezewski
- Timothy L. Pruett
- Axel Rahmel
- Lloyd E. Ratner
- Peter Reese
- Darren E. Stewart
Objective

• Right kidney to the right patient at the right time

Mission Statement

• Optimize access to kidney transplantation by improving utilization of kidneys across the entire KDPI spectrum
Good Kidney  Intermediate Kidney  HR Discard Kidney

Broad Acceptance  Aggressive Center, Risk Taking Surgeon
Odds of discard of kidneys is highest in UNOS regions with the lowest transplant rates

Adjusted Odds of Discard

Annualized Transplant Rates

Annualized transplantation rates calculated from 2000 through 2010
Expectations

• Align expectations across the continuum (patient, center, payers, regulators)
  • What are we solving to?
    • Maximize 1 year graft/patient survival?
  • What should we solve to?
    • Optimize ESRD patient survival?
    • Optimize organ utilization?
    • Getting patients off dialysis or avoiding dialysis?
    • Maximizing value to all parties?
    • Maximize quality of life?
    • Needs to be measured and defined
Outcomes

• Continuing to define “time zero” for outcomes as the day of transplant will continue our cycle of misaligned quality metrics
• Some time prior to transplant as time zero may be more relevant to patients – getting off dialysis
• Still need better quantification of patient preferences

Expectations

• Without utility, there is no equity
Oversight, Oversight, Oversight!

<table>
<thead>
<tr>
<th>NAME</th>
<th>DISTANCE</th>
<th>TRANSPLANT VOLUME</th>
<th>TRANSPLANT RATE</th>
<th>OUTCOME ASSESSMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>217</td>
<td>22.4</td>
<td>AS EXPECTED</td>
</tr>
</tbody>
</table>

The outcome assessment is a risk-adjusted assessment evaluating how often patients are alive with a functioning transplanted organ 1 year after transplant. The assessment is assigned after case-mix adjustment for the types of recipients who undergo transplant at the program and the donors used by the program. Programs are placed in the better or worse than expected category if we have 97.5% or greater probability that their outcomes are better or worse than expected based on national norms, respectively; otherwise they are placed in the “As Expected” category. Search results are sorted by adult outcome assessments then by Transplant Volume by default, so programs with the best assessments appear at the top of the list. You can choose to view assessments for pediatric recipients from the recipient drop-down list above; however, SRTR may not evaluate outcomes for pediatric recipients if too few transplants are performed. Click [here](#) for more information. You may also evaluate this data using the 5-tier system.

Georgetown University Medical Center
Washington, DC

View Summary Data
View Complete Report (PDF)

Also transplants Intestine, Kidney-Pancreas, Liver, Pancreas
Consequences, Consequences, Consequences!

![Graph showing changes in volume between 1/2007 and 1/2010 PSR Cohorts for different categories of performance centers.]

- **Low Performance Centers**:
  - 19% of centers were Low Performing for graft survival with a mean decline of 26.8 transplants.
  - Other centers had a mean increase of 7.5 transplants.

- **Centers without Low Performance**:
  - 13% of centers were Low Performing for patient survival with a mean decline of 29.3 transplants.
  - Other centers had a mean increase of 5.8 transplants.

- **Either Graft or Patient Survival**:
  - 23% of centers were Low Performing for graft or patient survival with a mean decline of 22.4 transplants.
  - Other centers had a mean increase of 7.8 transplants.

*Schold JD et al, Am J Transplant. 2013 Jan;13(1):67-75*
Patients, Patients, Patients!

<table>
<thead>
<tr>
<th>Number of Low Performance Evaluations</th>
<th>Adjusted Hazard Ratio for Wait List Removal</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>- Reference -</td>
</tr>
<tr>
<td>1</td>
<td>1.21 (1.13 – 1.29)</td>
</tr>
<tr>
<td>2-3</td>
<td>1.49 (1.44 – 1.54)</td>
</tr>
<tr>
<td>4+</td>
<td>1.95 (1.88 – 2.02)</td>
</tr>
</tbody>
</table>

Rate of Wait List Removal (per 1000 follow up years)

- Number of Low Center Performance Evaluations (number of candidates listed)

- 0: 44.6 (44.0, 45.1) (n=243,316)
- 1: 48.8 (45.6, 51.9) (n=11,729)
- 2-3: 64.1 (62.3, 66.0) (n=39,087)
- 4+: 83.9 (81.1, 86.6) (n=21,664)
Do we really know our comparator?

Transplant center tiers

Log-Rank p-value < 0.001

Schold J CJASN 2014, 9 (10) 1773-1780

Knowledge and Compassion Focused on You

MedStar Georgetown Transplant Institute
Do we really know our comparator?

Transplant center tiers

Dialysis!

Schold J CJASN 2014, 9 (10) 1773-1780
Possible New Benchmarks/Balanced Scorecard

- Number of referrals from dialysis centers
- Number of pre-emptive referrals
- Time to evaluation
- Time to listing
- Listing rates (need to be risk adjusted)
- Time to transplant
- Transplant rate
- Active vs. Inactive candidates
Recipient Selection

• Listing criteria are not uniform among centers
  • Candidates unaware of differences from center to center
  • Is education and universal access more important?
  • A menu of transplant center practices (what is offered, who is accepted at that center – data driven)
• Guidelines are not mandatory, but centers must have criteria and follow their own criteria
• Centers of Excellence?
### Kidney Minimum Acceptance Criteria

#### Donor History & Management

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is the maximum donor age your center will consider?</td>
<td>80</td>
</tr>
<tr>
<td>Will your center consider kidneys from a donor with an unknown cause of death?</td>
<td>Yes</td>
</tr>
<tr>
<td>Will your center consider kidneys from a donor with a history of cancer (other than a primary brain tumor):</td>
<td></td>
</tr>
<tr>
<td>- less than one year ago?</td>
<td>Yes</td>
</tr>
<tr>
<td>- 1 to 5 years ago?</td>
<td>Yes</td>
</tr>
<tr>
<td>- 6 to 10 years ago?</td>
<td>Yes</td>
</tr>
<tr>
<td>- more than ten years ago?</td>
<td>Yes</td>
</tr>
<tr>
<td>Will your center consider kidneys from a donor with a primary brain tumor that is:</td>
<td></td>
</tr>
<tr>
<td>- malignant (i.e. Glioblastoma, Astrocytoma, Medulloblastoma)?</td>
<td>No</td>
</tr>
<tr>
<td>- non-malignant (i.e. Menigioma, Ependymoma, Neuroblastoma)?</td>
<td>Yes</td>
</tr>
<tr>
<td>Will your center consider kidneys from a donor with meningitis as the cause of death?</td>
<td>Yes</td>
</tr>
<tr>
<td>Will your center consider kidneys from a donor:</td>
<td></td>
</tr>
<tr>
<td>- with evidence of current injection of non-prescription drugs?</td>
<td>Yes</td>
</tr>
<tr>
<td>- with history of past injection of non-prescription drugs?</td>
<td>Yes</td>
</tr>
<tr>
<td>- that is male who has had sex with another man in the last 5 years?</td>
<td>Yes</td>
</tr>
<tr>
<td>- who has engaged in sex in exchange for money/drugs in the last 5 years?</td>
<td>Yes</td>
</tr>
<tr>
<td>- who has been an inmate of a correctional system?</td>
<td>Yes</td>
</tr>
<tr>
<td>- with other high risk factors (such as being exposed in the preceding 12 months to known or suspected HIV infected blood through percutaneous inoculation or contact with an open wound, nonintact skin, or mucous membrane; or defined as &quot;high risk&quot; based on OPO criteria)?</td>
<td>Yes</td>
</tr>
<tr>
<td>- with an unknown history (no historian available)?</td>
<td>Yes</td>
</tr>
<tr>
<td>Will your center consider kidneys from a donor with a positive result from any of the following infectious disease tests:</td>
<td></td>
</tr>
<tr>
<td>- Hepatitis B Surface Antigen?</td>
<td>Yes</td>
</tr>
<tr>
<td>- Hepatitis B Core Antibody with no IGG/IGM testing?</td>
<td>Yes</td>
</tr>
<tr>
<td>- Hepatitis B Core Antibody with IGM testing?</td>
<td>Yes</td>
</tr>
<tr>
<td>- HBV NAT?</td>
<td>Yes</td>
</tr>
<tr>
<td>- Anti-HCV?</td>
<td>Yes</td>
</tr>
<tr>
<td>- HCV NAT?</td>
<td>Yes</td>
</tr>
<tr>
<td>- HTLV 1 or 2?</td>
<td>No</td>
</tr>
<tr>
<td>- Syphilis?</td>
<td>Yes</td>
</tr>
</tbody>
</table>
### Age Specific (Donor Age)

Questions within the section should be answered for each of the 4 donor age groups.

Identify the duration for which your center will consider donor kidneys for the specified circumstance.

<table>
<thead>
<tr>
<th>Question</th>
<th>&lt;45 years</th>
<th>45-54 years</th>
<th>55-64 years</th>
<th>&gt;64 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>With a history of hypertension and compliant with medication?</td>
<td>11 - 20 years</td>
<td>11 - 20 years</td>
<td>11 - 20 years</td>
<td>11 - 20 years</td>
</tr>
<tr>
<td>With a history of hypertension and period(s) of non-compliance within the last 5 years?</td>
<td>11 - 20 years</td>
<td>11 - 20 years</td>
<td>11 - 20 years</td>
<td>6 - 10 years</td>
</tr>
<tr>
<td>Who is an insulin dependent diabetic?</td>
<td>11 - 20 years</td>
<td>11 - 20 years</td>
<td>6 - 10 years</td>
<td>6 - 10 years</td>
</tr>
<tr>
<td>With diabetes and requires oral medication?</td>
<td>&gt;20 years</td>
<td>&gt;20 years</td>
<td>&gt;20 years</td>
<td>&gt;20 years</td>
</tr>
</tbody>
</table>

Identify the maximum acceptable amount of cardiac arrest (downtime) for which your center will consider donor kidneys.

<table>
<thead>
<tr>
<th>Question</th>
<th>&lt;45 years</th>
<th>45-54 years</th>
<th>55-64 years</th>
<th>&gt;64 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>With CPR?</td>
<td>&gt;30 min</td>
<td>&gt;30 min</td>
<td>&gt;30 min</td>
<td>&gt;30 min</td>
</tr>
<tr>
<td>Without CPR?</td>
<td>&gt;30 min</td>
<td>&gt;30 min</td>
<td>&gt;30 min</td>
<td>&gt;30 min</td>
</tr>
</tbody>
</table>

Enter the appropriate criteria your center will consider for each of the following questions.

<table>
<thead>
<tr>
<th>Question</th>
<th>&lt;45 years</th>
<th>45-54 years</th>
<th>55-64 years</th>
<th>&gt;64 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is the maximum acceptable peak serum creatinine level?</td>
<td>8 mg/dl</td>
<td>8 mg/dl</td>
<td>3 mg/dl</td>
<td>3 mg/dl</td>
</tr>
<tr>
<td>What is the maximum cold ischemic time (based on arrival time) on cold storage?</td>
<td>36 hrs</td>
<td>30 hrs</td>
<td>30 hrs</td>
<td>24 hrs</td>
</tr>
<tr>
<td>What is the maximum acceptable percentage of glomerular sclerosis for a biopsed kidney?</td>
<td>30 %</td>
<td>30 %</td>
<td>30 %</td>
<td>30 %</td>
</tr>
</tbody>
</table>
## B. Waiting List Information

Table B10. Offer Acceptance Practices: 07/01/2016 - 06/30/2017

<table>
<thead>
<tr>
<th>Offers Acceptance Characteristics</th>
<th>This Center</th>
<th>OPO/DSA</th>
<th>Region</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Offers</td>
<td>19,528</td>
<td>32,015</td>
<td>261,260</td>
<td>1,547,378</td>
</tr>
<tr>
<td>Number of Acceptances</td>
<td>132</td>
<td>254</td>
<td>1,594</td>
<td>12,795</td>
</tr>
<tr>
<td>Expected Acceptances</td>
<td>54.9</td>
<td>148.2</td>
<td>1,847.1</td>
<td>12,785.8</td>
</tr>
<tr>
<td>Offer Acceptance Ratio*</td>
<td>2.35</td>
<td>1.70</td>
<td>0.86</td>
<td>1.00</td>
</tr>
<tr>
<td>95% Credible Interval**</td>
<td>[1.97, 2.77]</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>
# Know Your Data!!!

## Medium-KDRI Donors (1.05 < KDRI < 1.75)

<table>
<thead>
<tr>
<th></th>
<th>9,167</th>
<th>16,564</th>
<th>146,025</th>
<th>1,021,475</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Offers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Acceptances</td>
<td>73</td>
<td>129</td>
<td>803</td>
<td>6,593</td>
</tr>
<tr>
<td>Expected Acceptances</td>
<td>25.9</td>
<td>66.7</td>
<td>924.5</td>
<td>6,581.3</td>
</tr>
<tr>
<td><strong>Offer Acceptance Ratio</strong></td>
<td><strong>2.69</strong></td>
<td><strong>1.91</strong></td>
<td><strong>0.87</strong></td>
<td><strong>1.00</strong></td>
</tr>
<tr>
<td><strong>95% Credible Interval</strong></td>
<td>[2.11, 3.33]</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>

## High-KDRI Donors (KDRI > 1.75)

<table>
<thead>
<tr>
<th></th>
<th>8,032</th>
<th>11,571</th>
<th>72,514</th>
<th>309,605</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Offers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Acceptances</td>
<td>34</td>
<td>37</td>
<td>155</td>
<td>1,119</td>
</tr>
<tr>
<td>Expected Acceptances</td>
<td>11.5</td>
<td>22.0</td>
<td>166.5</td>
<td>1,118.3</td>
</tr>
<tr>
<td><strong>Offer Acceptance Ratio</strong></td>
<td><strong>2.67</strong></td>
<td><strong>1.63</strong></td>
<td><strong>0.93</strong></td>
<td><strong>1.00</strong></td>
</tr>
<tr>
<td><strong>95% Credible Interval</strong></td>
<td>[1.87, 3.61]</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>
Report of Organ Offers

The visual display of the transplant center Report of Organ Offers (ROO) allows you to interact with all organ offers to your center during the recent 120 days. The file is updated weekly and includes both summarized and individual offer data.

Organ Offers Report TXC

- Organ Offers Report TXC
- Organ Offers Report OPO
- Kidney Waitlist Management Tool
- Recovery and Usage Maps (RUM) Report
- Living Kidney Donor Follow-up Report

Documentation

Have feedback or questions? 938.200.6000@unica.org

Authenticated as external13704 - welcome DCGU-TX1 member!

Organ Offers Dashboard | Donors Accepted | Ki Match List | Li Match List | HR/HL Match List | KP Match List | LU Match List

Matches 10/18/2017 - 4/15/2018 for All

Excludes Offers After the Last Acceptor on the Match

Donor Matches - click a bar to filter / unfilter refusal codes

Donor Id | Match Id | IN | Match Organ | Transplanted
---|---|---|---|---
AEJ11627 | 10983191 | Y | Y
AEJ11610 | 10983191 | Y | Y
AEJ11608 | 1098177 | LI | Y
AEJ1132 | 10981902 | IN | Y
AEJ1214 | 1098213 | LI | Y
AEJ1223 | 1098103 | Ki | Y
AEJ1247 | 1098381 | LI | Y
AEJ1257 | 1098171 | Ki | Y
AEJ1272 | 10981902 | IN | Y
AEJ1232 | 1098213 | HI | Y
AEJ1346 | 1098148 | LI | Y
AEJ1376 | 1098245 | IN | Y
AEJ1203 | 1098340 | Ki | Y
AEJ1245 | 1098391 | Ki | Y
AEJ2211 | 1098555 | IN | Y
AEJ2254 | 1098311 | KP | Y
AEJ2306 | 1098329 | Ki | Y

Matches by Month

Month

Top Refusal Codes

Offer Type

Match Has Acceptance

Match Organ

v1.2

Knowledge and Compassion Focused on You

MedStar Georgetown Transplant Institute
# Kidney Offer Acceptance Metrics: High Acceptance

<table>
<thead>
<tr>
<th>Donor Characteristics</th>
<th>Number of Offers</th>
<th>Number of Acceptances</th>
<th>Expected Acceptances</th>
<th>Offer Acceptance Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>2781</td>
<td>93</td>
<td>21.2</td>
<td>4.09</td>
</tr>
<tr>
<td>KDRI: &lt; 1.05</td>
<td>77</td>
<td>3</td>
<td>2.64</td>
<td>1.08</td>
</tr>
<tr>
<td>KDRI: 1.05-1.75</td>
<td>1681</td>
<td>54</td>
<td>14.45</td>
<td>3.4</td>
</tr>
<tr>
<td>KDRI: &gt; 1.75</td>
<td>1023</td>
<td>36</td>
<td>4.12</td>
<td>6.21</td>
</tr>
<tr>
<td>DCD Donor</td>
<td>262</td>
<td>10</td>
<td>1.14</td>
<td>3.82</td>
</tr>
<tr>
<td>PHS Increased Infectious Risk</td>
<td>839</td>
<td>26</td>
<td>4.38</td>
<td>4.39</td>
</tr>
<tr>
<td>HCV+</td>
<td>4</td>
<td>4</td>
<td>0.14</td>
<td>2.81</td>
</tr>
<tr>
<td>Weekend</td>
<td>824</td>
<td>30</td>
<td>6.26</td>
<td>3.87</td>
</tr>
</tbody>
</table>
Kidneys are harder to place on the weekend

King et al. CJASN 2018 Accepted
Kidneys procured over the weekend are more likely to be discarded even after adjusting for quality.

Higher quality kidneys discarded on the weekend
Discard data calculated using data from 2000 through 2013

Day of Procurement

Recipient Selection – New Allocation Categories

- Selection for expedited placement
  - New "EPTS" vs. pre-transplant survival for brevity matching
    - Candidates would “roll out” of the group with added waiting time
    - Greatest benefit from high KDPI kidneys is with rapid access
    - Once several years accrued or passed on multiple offers, roll out of the intentionally small pool of candidates
Survival Benefit from Rapid Transplant (SBRT)

**Proposed model**

Patient meets inclusion criteria and consents.

Patient listed

1 year → 2 years → 3 years

High KDPI offer → Patient declines → Out of high KDPI sequence

Patient accepts offer → Transplanted with high KDPI kidney

Transplanted with lower KDPI kidney

4 years
Excellent quality kidneys from deceased donors are being discarded

Better

Worse

Most common reasons cited for discard are donor characteristics and biopsy findings.

Discard data calculated using data from 2000 through 2015.

Work Group 3: Research and Education

**Co-Chairs:** Sumit Mohan, Jesse Schold

**Participants:**
- Kevin C. Abbott
- Charles Alexander
- Anthony F. Bonagura
- Mariana C. Chiles
- Kevin Fowler
- Melissa Greenwald
- Leal C. Herlitz
- Ian R. Jamieson
- Liise K. Kayler
- Alan B. Leichtman
- Jonah Odim
- Chirag R. Parikh
- Marcus R. Pereira
- Andreas Price
- Kunam Reddy
- Alan I. Reed
- James R. Rodrigue
- Daniel Schwartz
- Jon Snyder
- Sarah E. Taranto
- Bob Walsh
Accurate Assessment of organ quality

• Biopsy – as currently performed its contribution to assessing quality is unclear – and very far from being a “gold standard”
  • Advocate for a trial to evaluate biopsy utility
  • Biopsy technique/preparation/interpretation/reporting should be standardized
  • Central read by a renal pathologist – using digital pathology

• Gross organ photo for donor net
  • There is some variability in the utilization of gross photos of kidneys on donor net
  • Develop guidelines/standards for presenting gross photos: Adequately removing fatty tissue, highlighting vasculature
Accurate Assessment of organ quality

• Biopsy – as currently performed, its contribution to assessing quality is unclear – and very far from being a “gold standard”
  • Advocate for a trial to evaluate biopsy utility
  • Biopsy technique/preparation/interpretation/reporting should be standardized
  • Central read by a renal pathologist – using digital pathology

• Gross organ photo for donor net
  • There is some variability in the utilization of gross photos of the kidneys on the donor net
  • Develop guidelines/standards for presenting gross photos: Adequately removing fatty tissue, highlighting vasculature
  • Make posting the gross picture of the kidney on the donor net mandatory
Recognition that Discard → Complex Issue

• Solving the regulatory environment alone is only 1 piece of the puzzle.
  • Regulatory
  • Education (patient and provider)
  • Financial
  • Medical

• People need to get beyond the notion that ‘true’ risk adjustment models are the problem.
  • The field of transplantation is advanced in its data, monitoring, and quality improvement capabilities.
  • Improved and targeted data collection to capture risk, particularly recipient risk, should be a priority.
Education/Research Needs

• Develop and evaluate interventions designed to increase acceptance of kidneys that are at disproportionate risk of discard (IRD, high KDPI, etc.)

• Recognize patients are not the principal barrier to reducing organ turndown rates

• Identify factors contributing to variability in organ acceptance practices within/between providers and programs
Patients prioritize waitlist over posttransplant outcomes for selecting a transplant center

Only published national survey identifying patient centered criteria on selecting a transplant center
Over 500 respondents for survey conducted in 2017

Education/Research Needs

• Develop and evaluate interventions designed to modify provider behavior (i.e., increased acceptance of IRD kidneys)
  • Education alone will not reduce turndown rates
    • Knowledge is a necessary but insufficient agent of behavioral change
  • Impact of incentive structure
  • Evaluate benefit of new monitoring and feedback systems
• Identify and disseminate provider and center best practices re: organ acceptance
Offer Acceptance Decision Tool

The Idea: Enter donor, recipient, and offer characteristics and get projected likelihood of graft function and survival if accepting the offer or declining the offer.
Offer Acceptance Decision Tool
Offer Acceptance Decision Tool
Offer Acceptance Decision Tool
Growth in the need... and the waitlist

- Waitlist Additions
- Incidence of ESRD

Thousands

Number of patients NOT being waitlisted

MedStar Georgetown Transplant Institute

Knowledge and Compassion Focused on You
Conference Recommendations
Conference Recommendations

• OPO Initiatives/Directives
  • Communication
    • Improve ‘real-time’ communication with Tx Center at time of organ offer (Go back to the phone)
    • Collaborate with Tx Center to review all discards in the DSA
    • Expand OPO and Tx Center relationships beyond the DSA → Region
Conference Recommendations

• OPO Initiatives/Directives
  • Allocation
    • Expand the use of virtual crossmatching, esp. with high cPRA recipients
    • Routinely send prospective crossmatch material to several programs with recipients on matchrun
    • Grant ‘local backup’ to centers for exported organs to minimize CIT
    • Always identify ‘local backup’ for organs within DSA for high CPRA recipients or high KDPI organs
Conference Recommendations

• OPO Initiatives/Directives
  • Financial
    • Develop risk-stratified (high risk of discard) Organ Acquisition Costs for organs that substantially increase the costs for Tx Centers
Conference Recommendations

• Transplant Programs
  • Management
    • Waitlist management practices should work to educate patients on the acceptance of higher risk organs to prevent delays (HCV+, PHS IR, high KDPI)
    • Develop and implement decision-support tools to help physicians evaluate benefits of accepting higher risk organs for particular recipient
    • Disseminate best practices from Tx Centers that routinely accept high risk organs (COIIN)
Conference Recommendations

• UNOS

• Create expedited placement pathways to directly offer kidneys with high KDPI, or at risk of discard, to small subset of centers that opt-in. Centers must maintain high rates of acceptance to remain.

• Identify organs that become a high risk for discard during standard allocation, and shunt them to patients at ‘rescue centers’ that utilize high risk organs.

• Standardize provision of gross photos of procured kidneys and post on DonorNet.
Conference Recommendations

• SRTR

• Develop Quality of Life (QOL) metrics to support use of higher risk organs expected to have higher rates of graft loss.

• Re-evaluate all transplant center metrics that ‘punish’ transplant centers that utilize high risk organs.

• Monitor and report organ acceptance as an index of transplant center performance.
Conference Recommendations

• NIH/Research

  • Standardize technical aspects of obtaining and interpreting renal biopsies, and focus on their use of ruling in, rather than ruling out.

  • Complete a randomized trial of renal biopsy use in organ procurement and acceptance.

  • Fund research into organ procurement methodology.
Conference Recommendations

• Payors

  • Develop a risk-adjusted payment system to compensate Tx Centers for the increased costs of higher risk kidneys.
Thank-you!