



MedStar Georgetown
Transplant Institute

Knowledge and Compassion
Focused on You

Increasing Kidneys for Transplantation: Decreasing Discards

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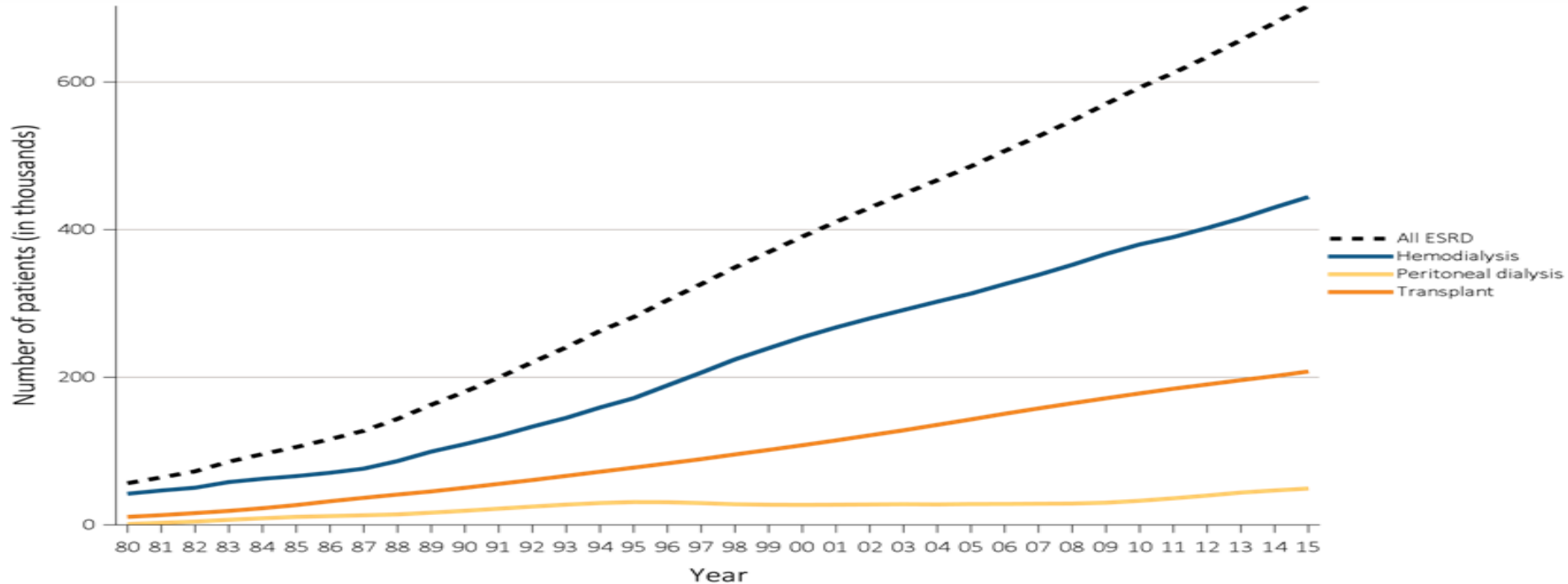
I have no conflicts of interest

I have no conflicts of interest



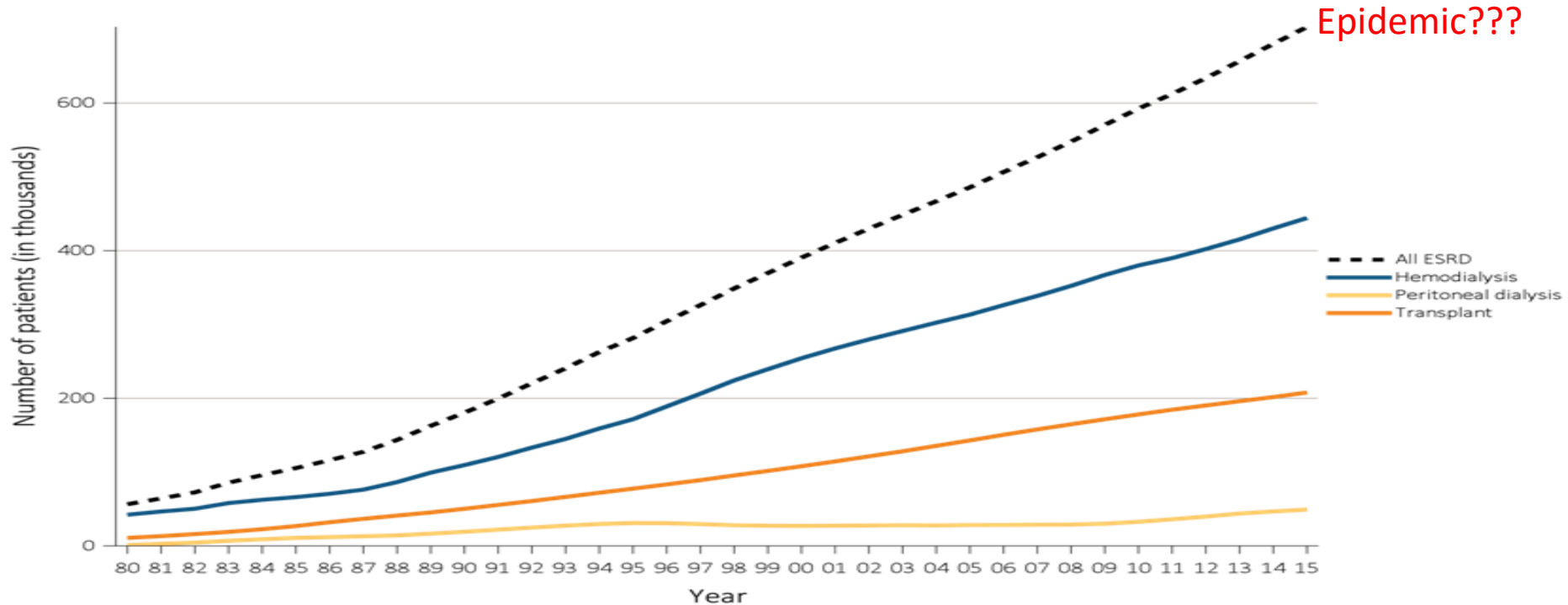
am, however, incredibly conflicted with the U.S. Organ Discard Rate.....

Growing Incidence of ESRD



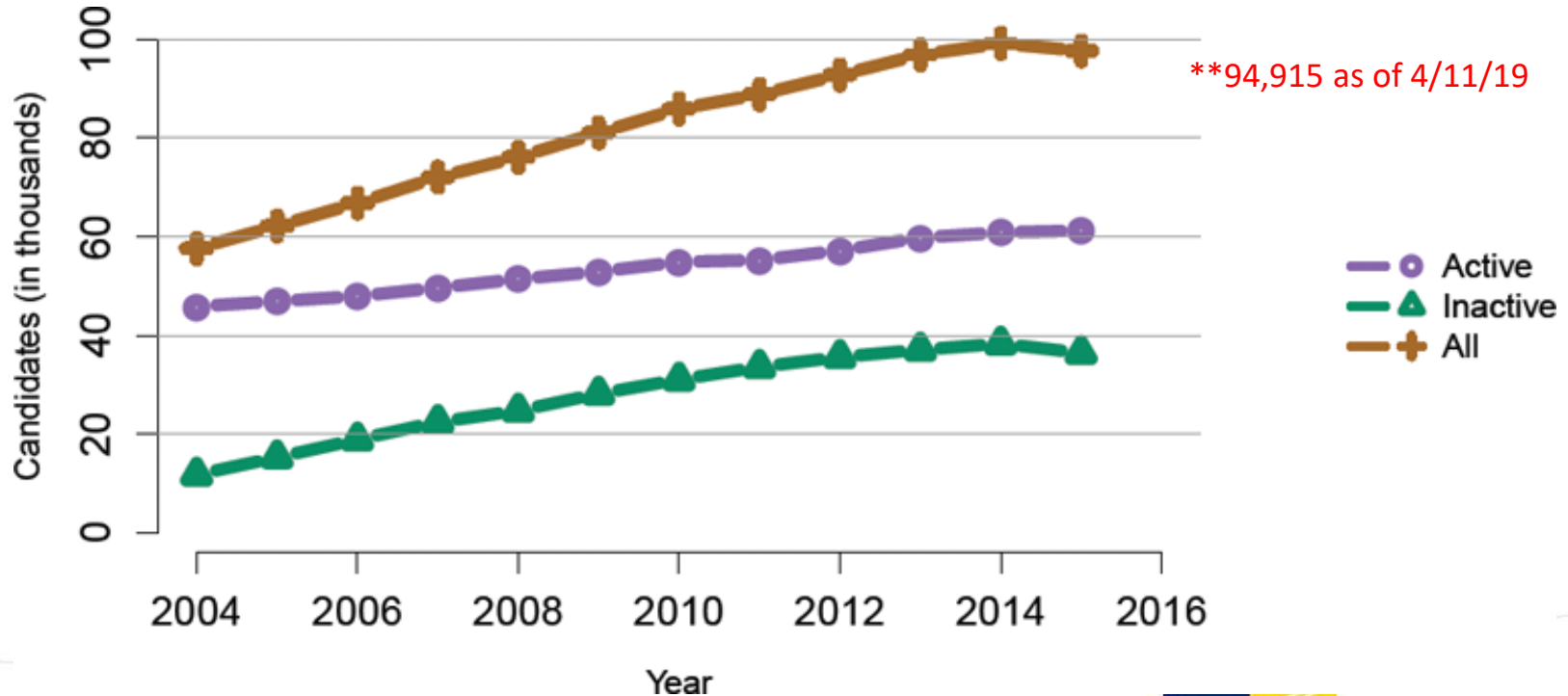
Data Source: Reference Table D.1. Abbreviation: ESRD, end-stage renal disease.

Growing Incidence of ESRD

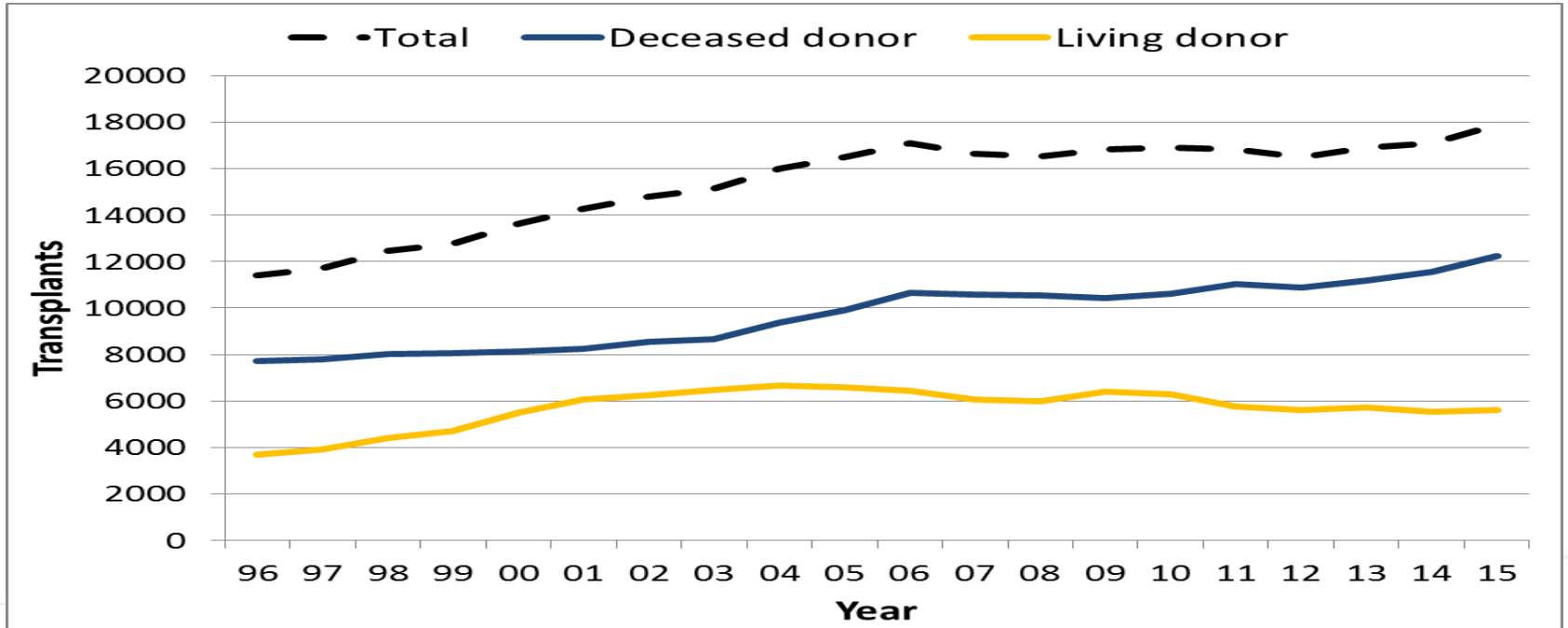


Data Source: Reference Table D.1. Abbreviation: ESRD, end-stage renal disease.

The Growing Waiting List

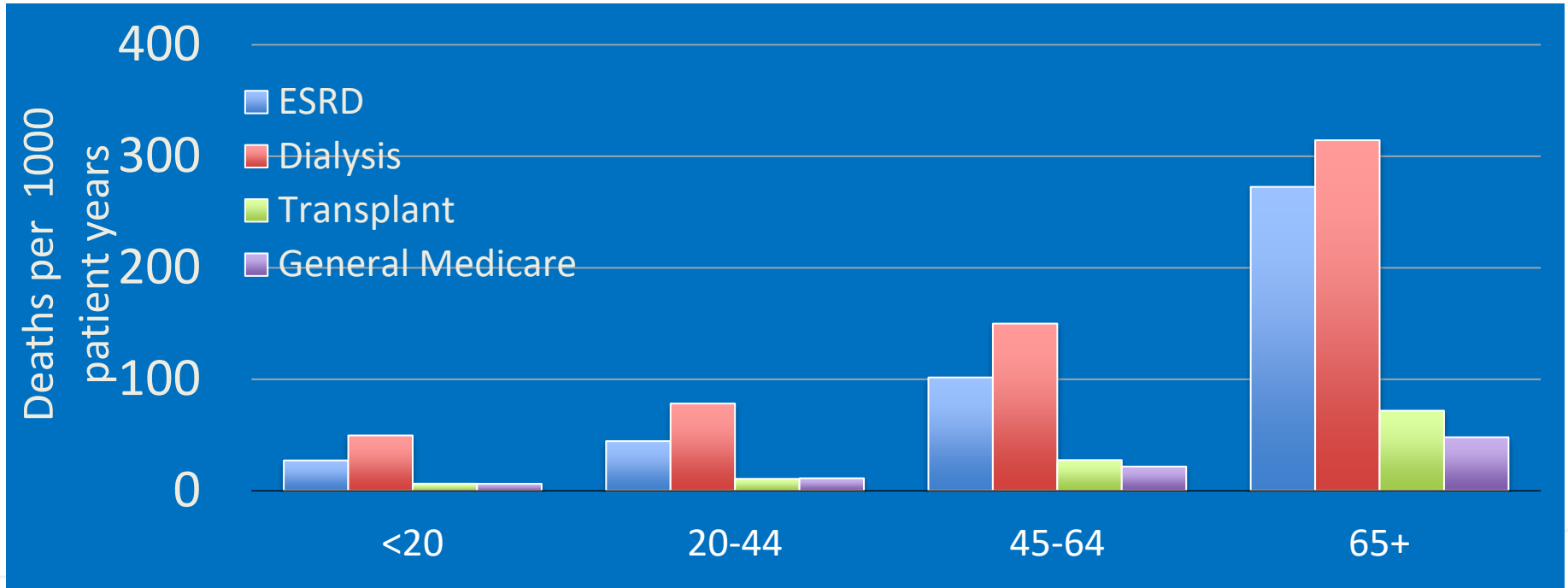


Kidney Transplant Totals



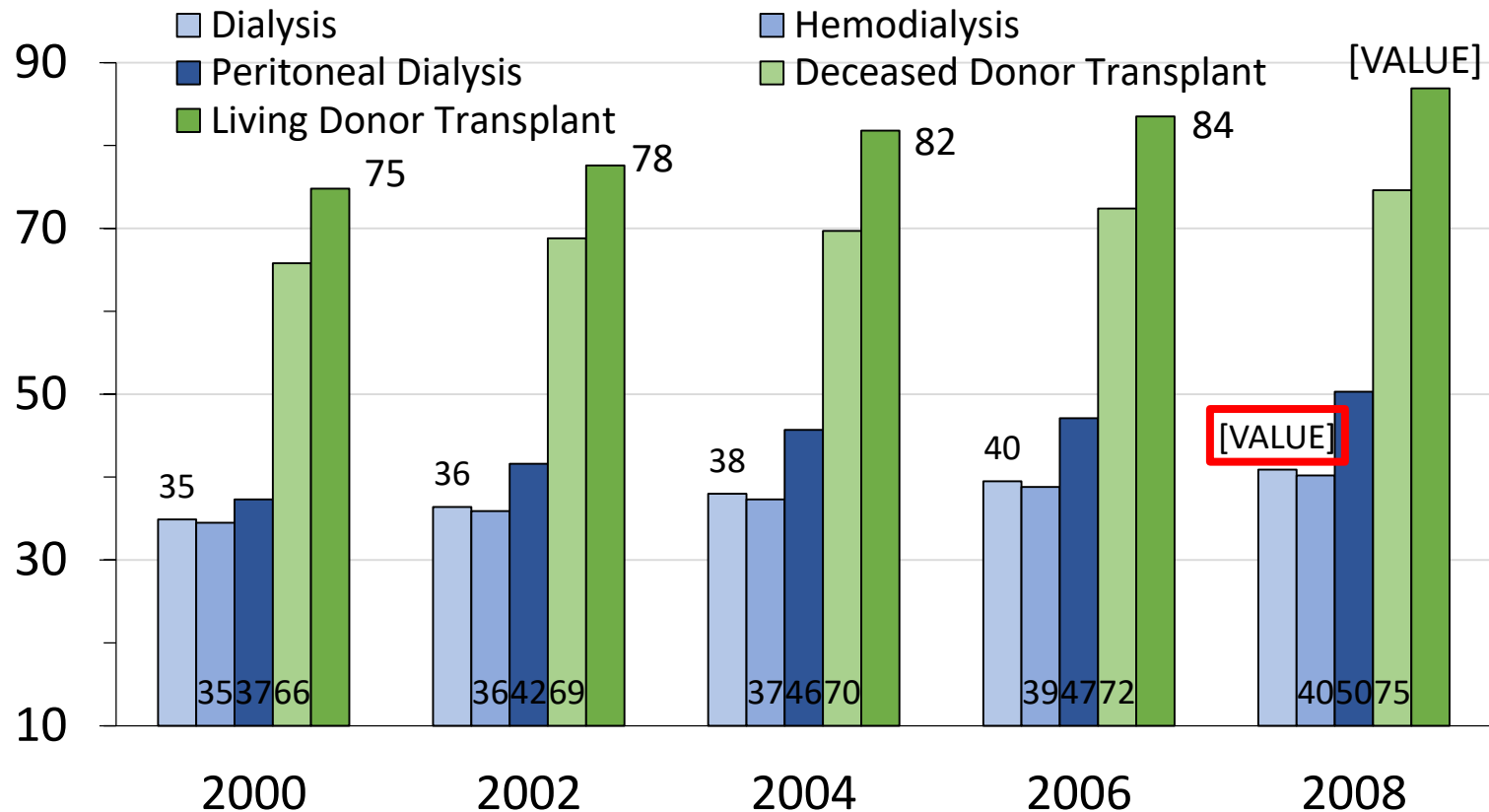
Transplant is the preferred option

All cause mortality among Medicare beneficiaries

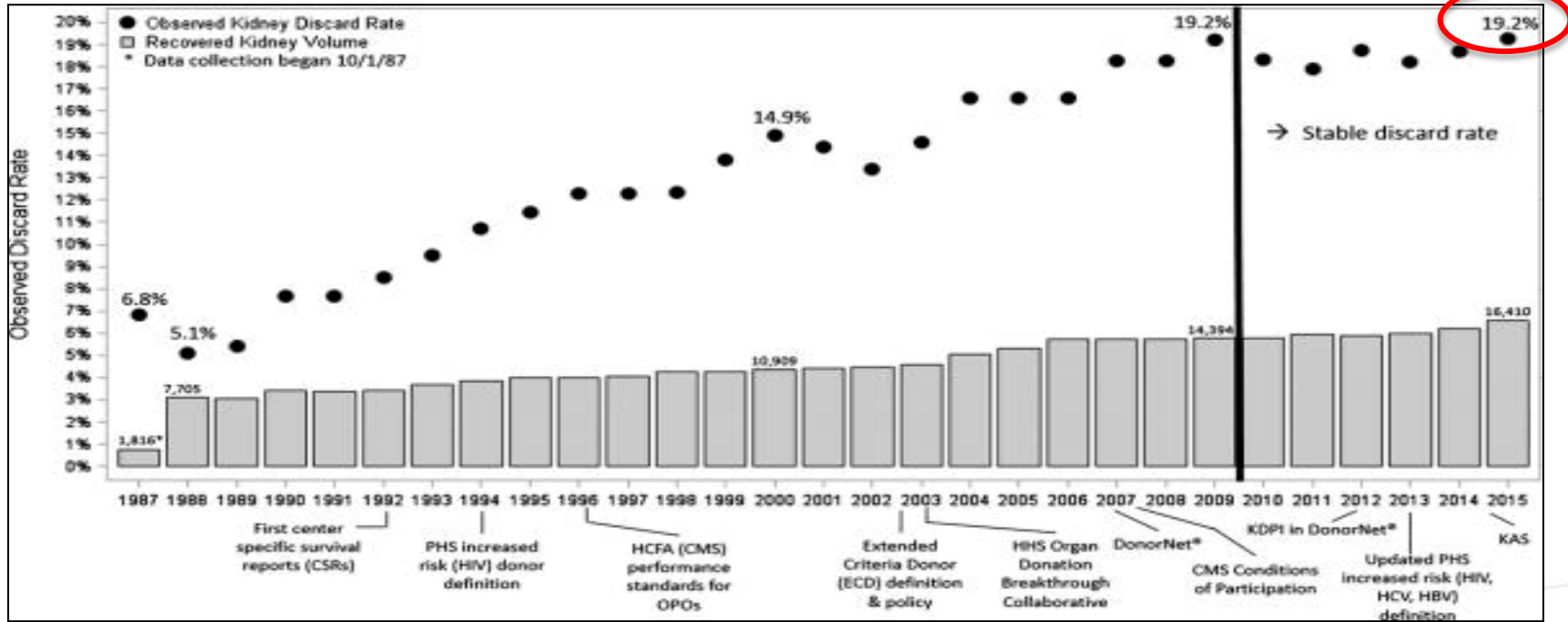


Prevalent ESRD patients from date June 30, 2011. USRDS 2013 ADR Figure 5.2

5 year survival rates for ESRD by modality



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

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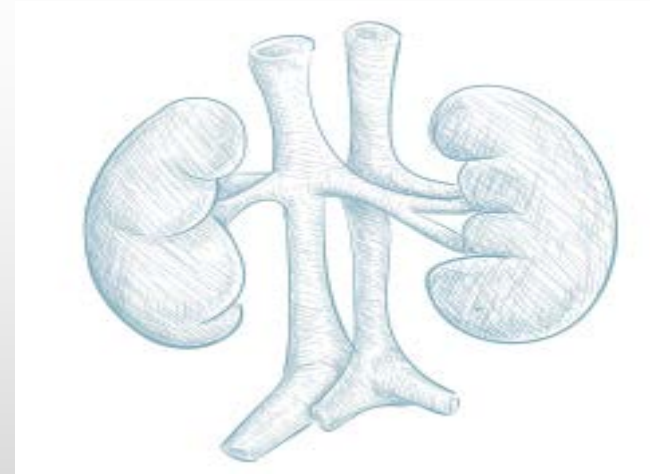
NKF Consensus Conference to Decrease Kidney Discards

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
- # 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

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)

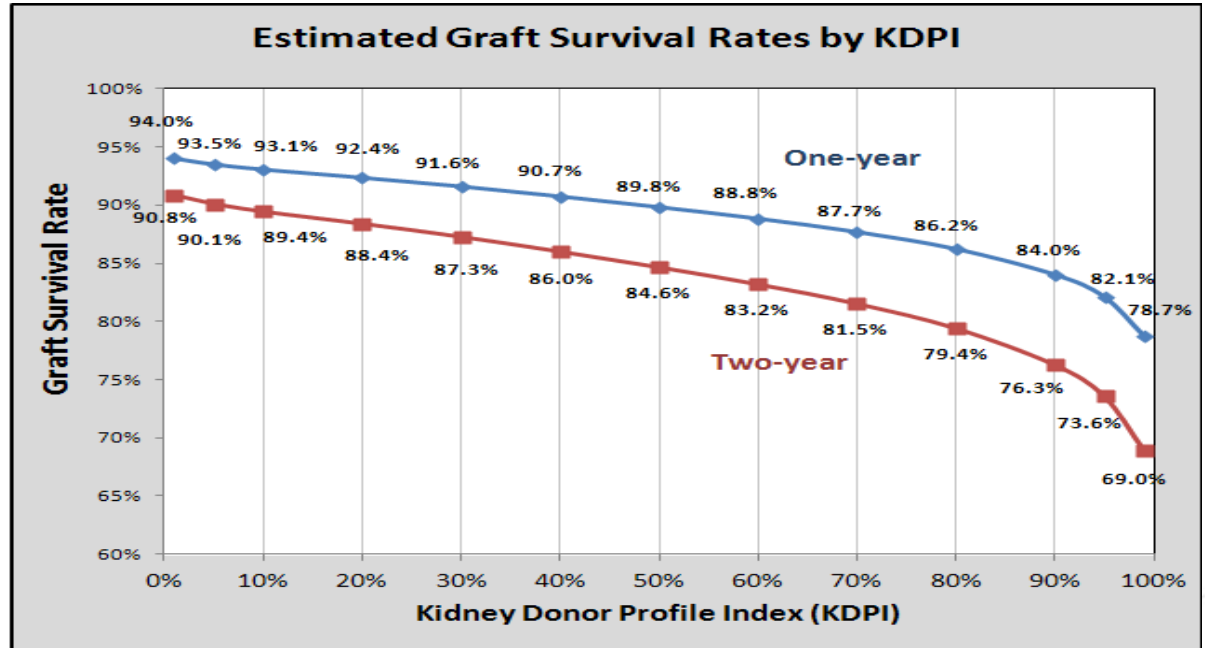
209 donors

418 – 17 – 34 = 367 (88% utilization)

Kidney Donor Profile Index (KDPI)

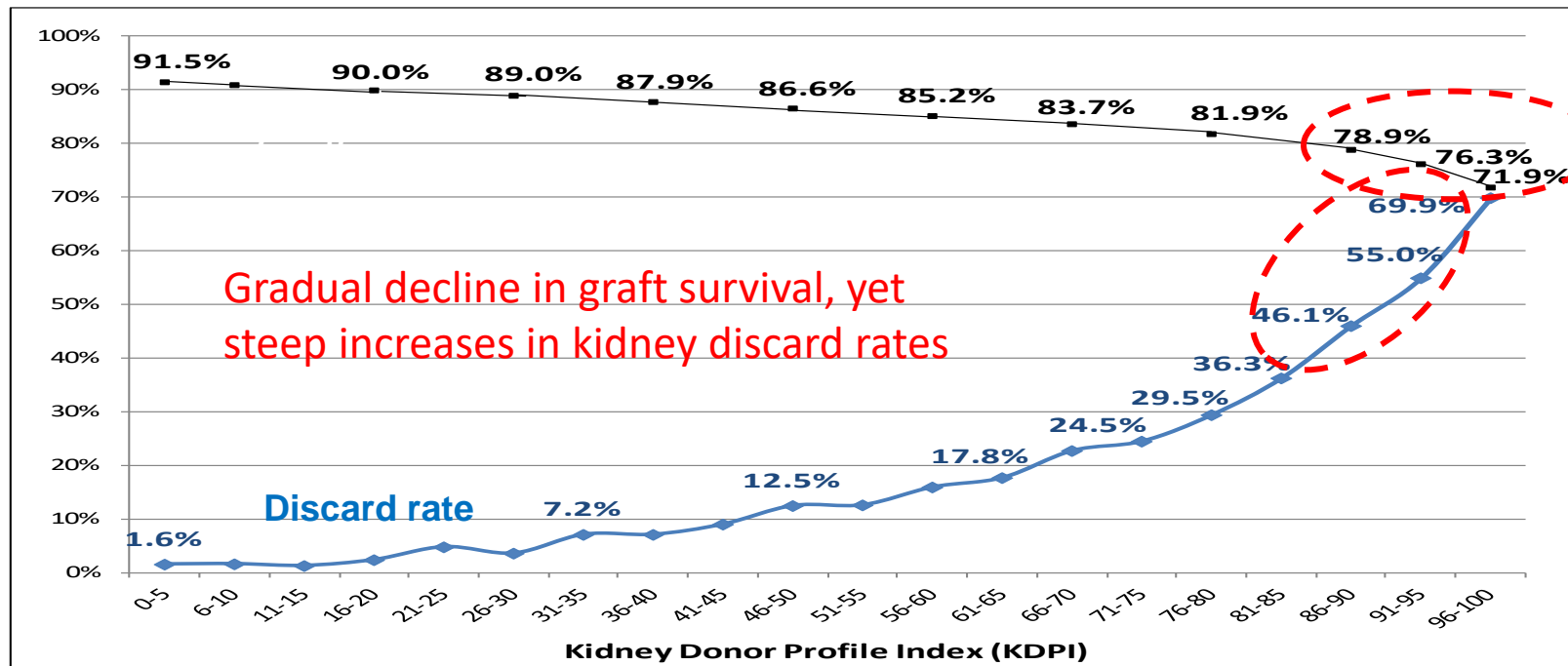
KDPI Variables

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

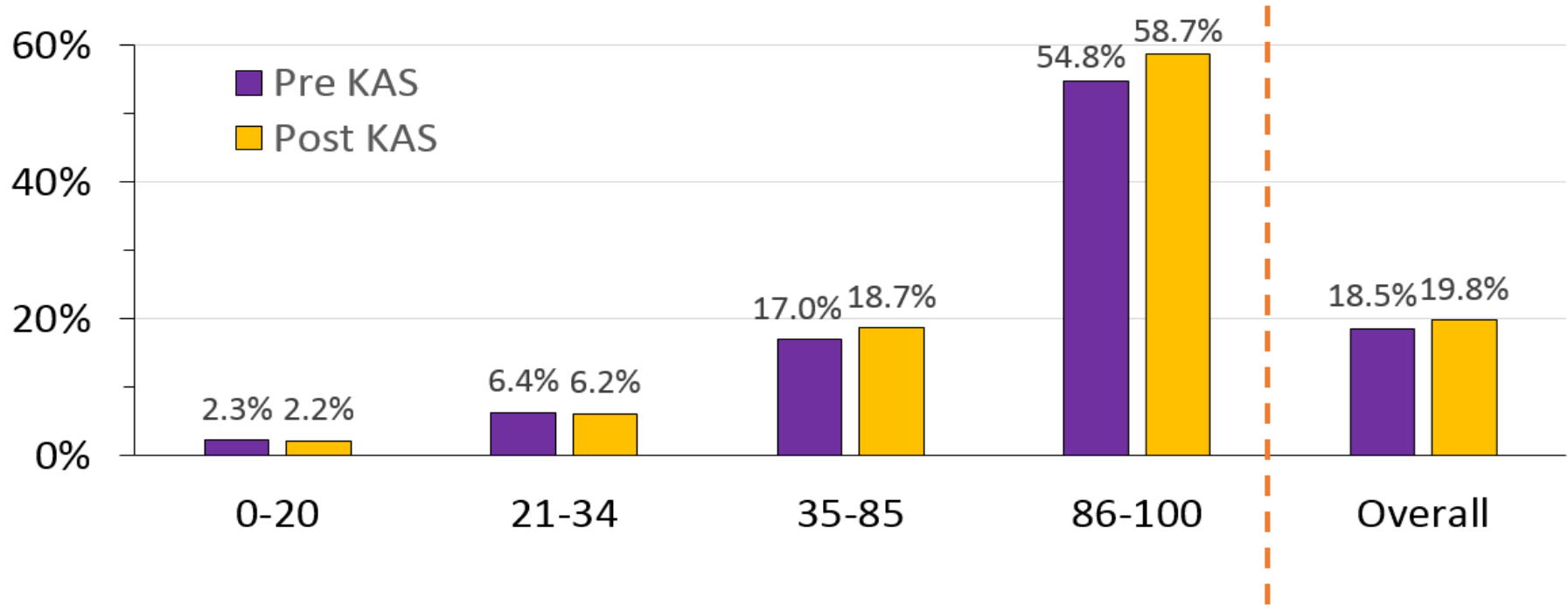


The pathologic findings are NOT included in KDPI

Graft Survival & Discard Rates by KDPI



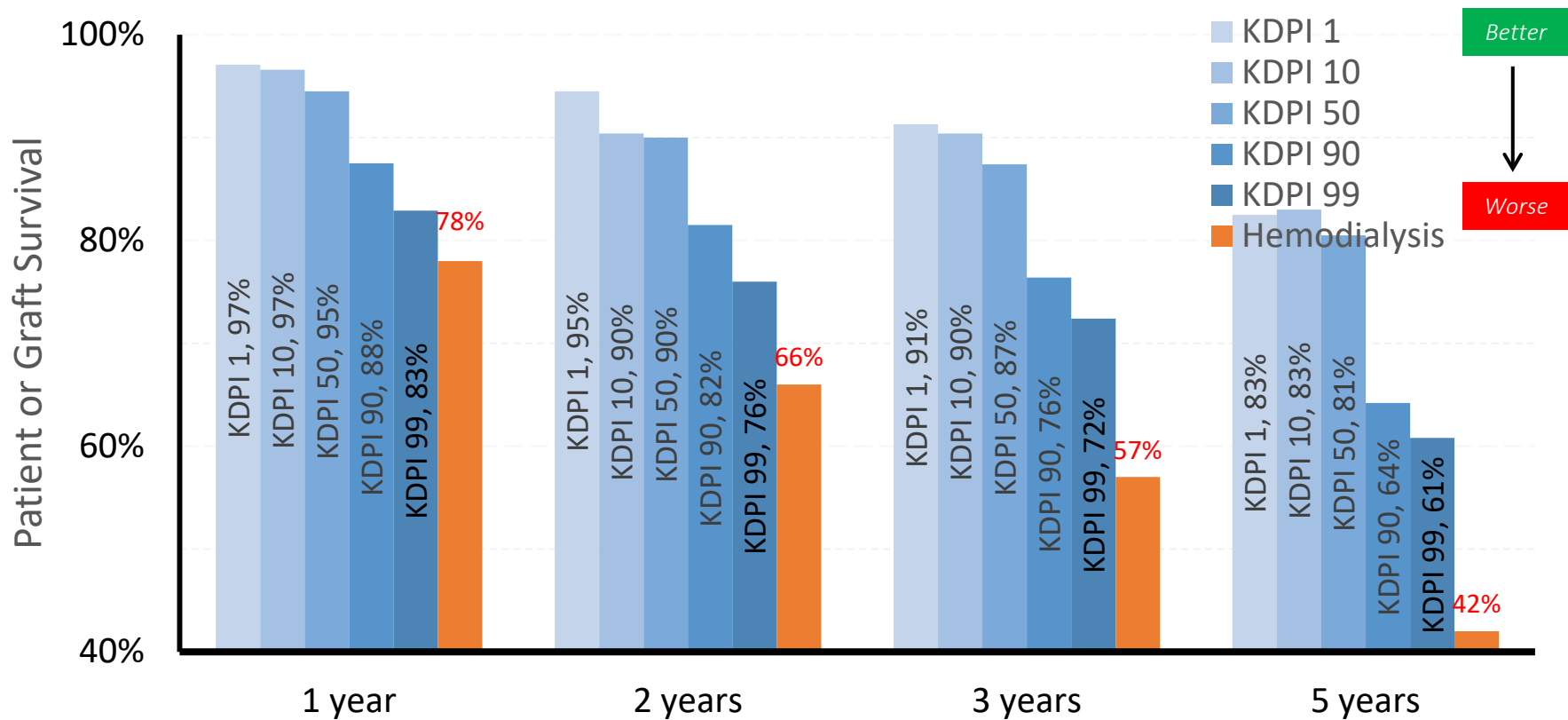
Impact of KDPI Labeling on Kidney Discard



June 21, 2019

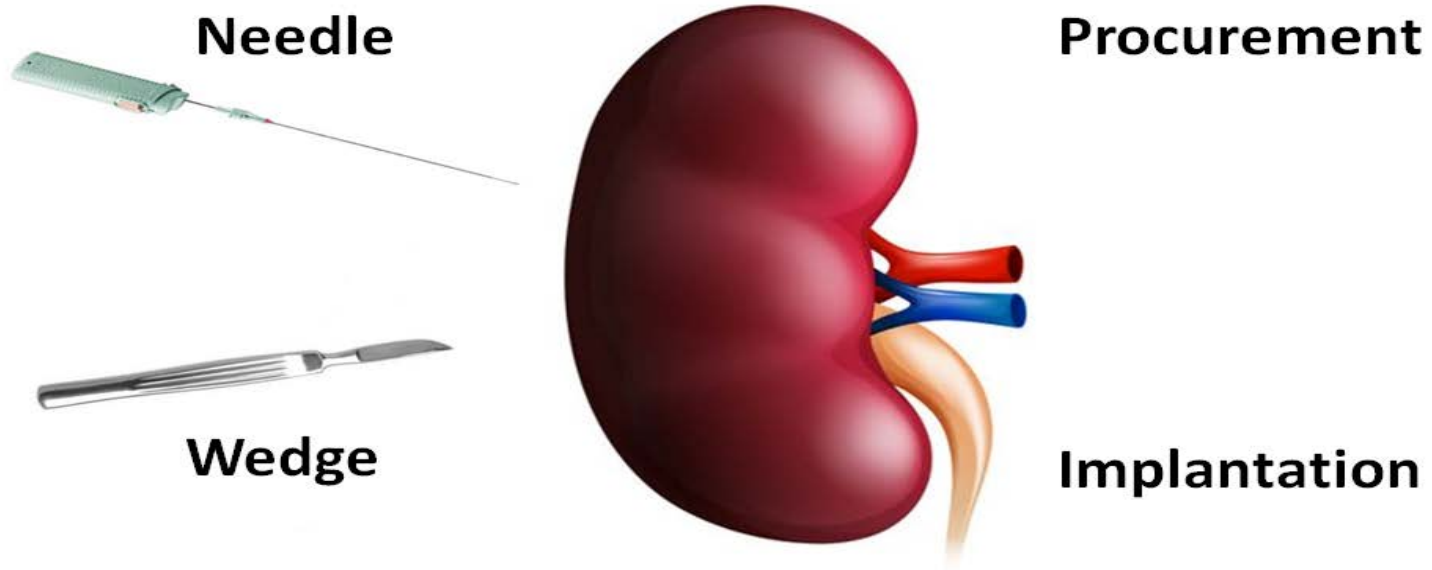
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Graft outcomes with even the lowest quality kidneys exceed average dialysis patient survival



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.

The Donor Kidney Biopsy



More History than Science??

0941-1337/96/0604-334\$03.00/0
TRANSPLANTATION
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Vol. 60, 334-339, No. 4, August 27, 1996
Printed in U.S.A.

GLOMERULOSCLEROSIS AS A DETERMINANT OF POSTTRANSPLANT FUNCTION OF OLDER DONOR RENAL ALLOGRAFTS

LILLIAN W. GABER,¹ LINDA W. MOORE, RITA R. ALLOWAY, M. HOSEIN AMIRI, SANTIAGO R. VERA, AND A. OSAMA GABER

Department of Pathology and Division of Transplantation, Departments of Surgery, The University of Tennessee—Memphis, Memphis, Tennessee

Transplantation of kidneys from older donors is being advocated to expand the organ donor pool. However, the prevalence of atherosclerosis and age-induced renal structural alterations account for the variable function of allografts procured from these older donors. Pretransplant biopsies are sometimes used to evaluate kidneys from older donors, but to date there are no defined criteria correlating the extent of structural alterations in these kidneys to subsequent function. We investigated the effect of glomerulosclerosis, a marker for nephrosclerosis, on graft outcome. Sixty-five baseline biopsies of kidney allografts were retrospectively analyzed to identify a referent point of glomerulosclerosis that correlated with inferior graft outcome. Age and death from nontraumatic cerebrovascular injuries were the main correlates for donor glomerulosclerosis ($P < 0.001$). Allografts with poor function at 6 months defined as serum creatinine > 2.5 mg/dl ($n = 13$) or nephrectomy ($n = 4$) had a mean of 20% glomerulosclerosis at the time of implantation compared with only 2% sclerosis in allografts with good function ($P < 0.05$). Delayed graft function occurred in 22% and 33% of recipients with no glomerulosclerosis and those with less than 20% glomerulosclerosis, respectively. In contrast, patients receiving kidneys with $> 20\%$ sclerosis had an 87% incidence of delayed function ($P < 0.05$). Moreover, graft loss occurred in 7% of recipients of kidneys with less than 20% sclerosis and in 38% of recipients with $> 20\%$ sclerosis ($P < 0.04$). Measurements of serum creatinine in the donors did not distinguish the different degrees of glomerulosclerosis on biopsy. Our data indicate that donor glomerulosclerosis greater than 20% increases the risk of delayed graft function and poor outcome of transplanted kidneys. Therefore, we advocate the use of routine biopsies of kidneys from older (> 50 yrs) donors and those donors with nontraumatic cerebrovascular accidents, despite seemingly normal preprocurement serum creatinine.

Increasing demand for cadaveric kidneys has motivated transplant centers to consider alternatives for maximizing the rate of acceptance of cadaver donor organs. Acceptance of older donors has the potential of increasing the organ donor pool by 20% (1). However, data regarding the long-term function and survival of such kidneys remains unsettled. Although several studies have demonstrated comparable survival rates for kidneys from young and old donors, (2-4)

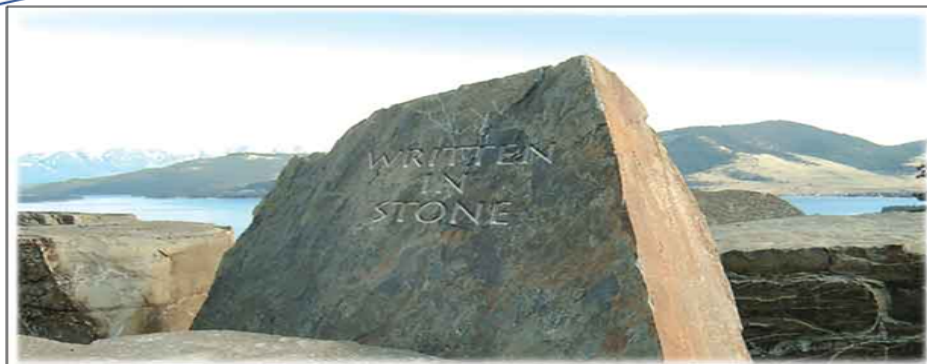
others have expressed more caution in using old donor kidneys due to the increased risk of primary graft failure, delayed graft function (DGF),^{*} rejection, and overall reduction of graft survival (5, 6). This discrepancy can be largely explained by the shortcomings of the current criteria used for screening old donors. Clinical criteria used for donor evaluation based on detailed medical and social history and laboratory investigations have been largely adequate for identifying high-risk donors or marginal kidneys but have not been age-discriminatory (3). For example, age-related decline in renal function is often masked by a normal serum creatinine in elderly individuals—therefore, such marginal kidneys will be identified as acceptable. In addition, estimation of nephrosclerosis by gross examination of the kidney is, at best, crude and is capable of only distinguishing extensive renal scarring. Accurate determination of the structural and functional status of the kidneys at the time of procurement is particularly important for aging kidneys, since the immunologic and hemodynamic changes induced by transplantation aggravate the preexisting lesions of aging. Taking these factors into account, it is essential to establish specific selection criteria for donors that guarantee acceptance of grafts with no or their minimal preexisting pathology. Recently, structural-based criteria for acceptance of extrarenal allografts have been identified (7). To date, however, and despite sporadic use of renal biopsies for donor kidney evaluation, there have been no published reports of histologic features that identify high-risk kidney allografts from old donors.

Epidemiologic and biopsy studies of biopsy changes secondary to aging support the view that older donor kidneys are more likely to exhibit a greater degree of nephrosclerosis, reduction of renal plasma flow, and a decline in renal function (8-12). Furthermore, examination of donor kidney biopsies obtained at the time of transplantation has shown a greater prevalence of age-related pathology, with a striking 80% incidence of histologic manifestations of chronic nephron loss in kidneys procured from donors older than 50 years (13). The high prevalence of renal pathology in the older donors can be attributed in part to the mechanism of brain death in this group, which has been largely due to nontraumatic cerebrovascular hemorrhage (14), thus preselecting individuals with hypertension or vascular atherosclerosis, both highly associated with renal abnormalities (11, 12).

We therefore hypothesized that glomerulosclerosis, being a marker for nephron loss, will have a direct negative effect on

* Abbreviation: CVA, cerebrovascular accident; DGF, delayed graft function; MAP, mean arterial blood pressure.

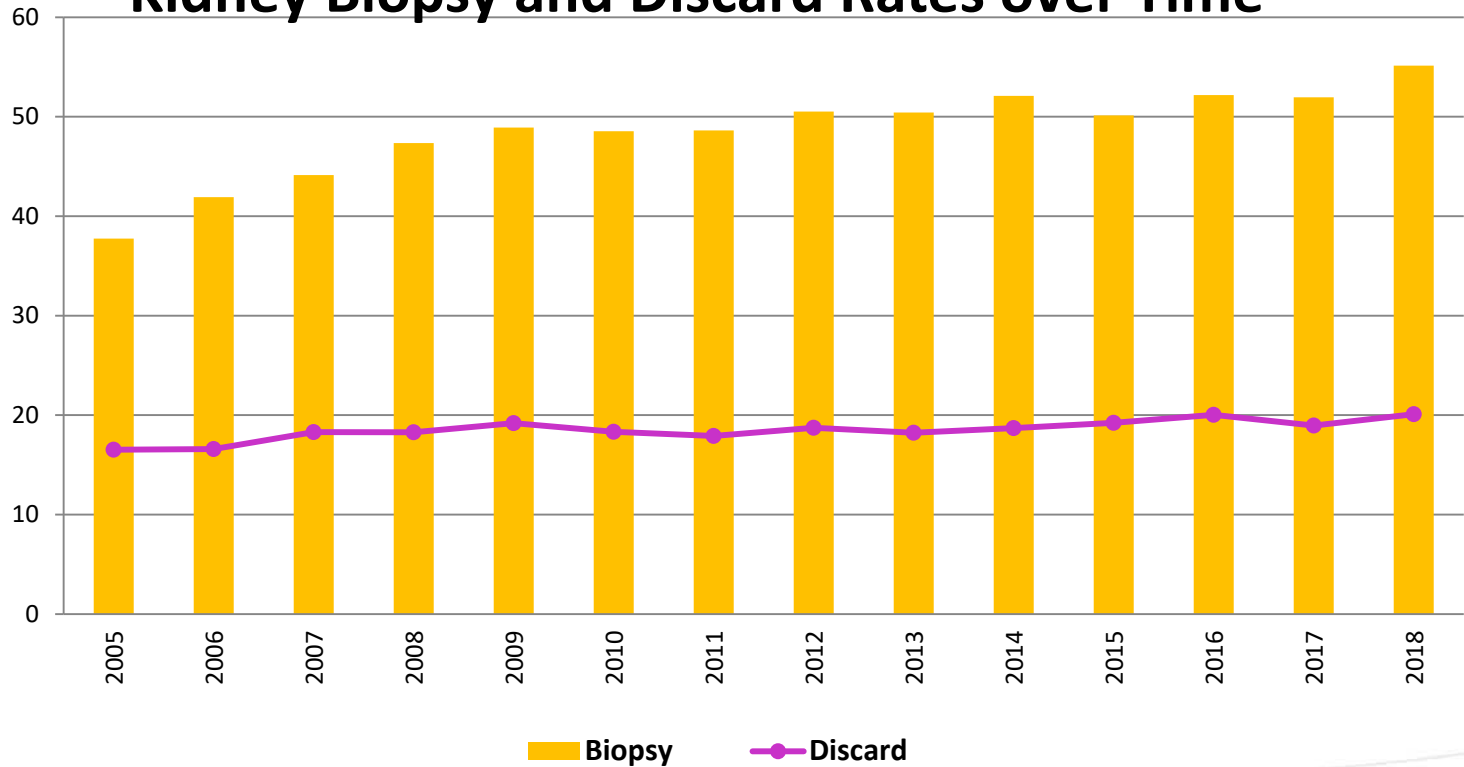
“Moreover graft loss occurred in 7% of recipients of kidneys with less than 20% and 38% with $> 20\%$ sclerosis ($P < 0.04$).”



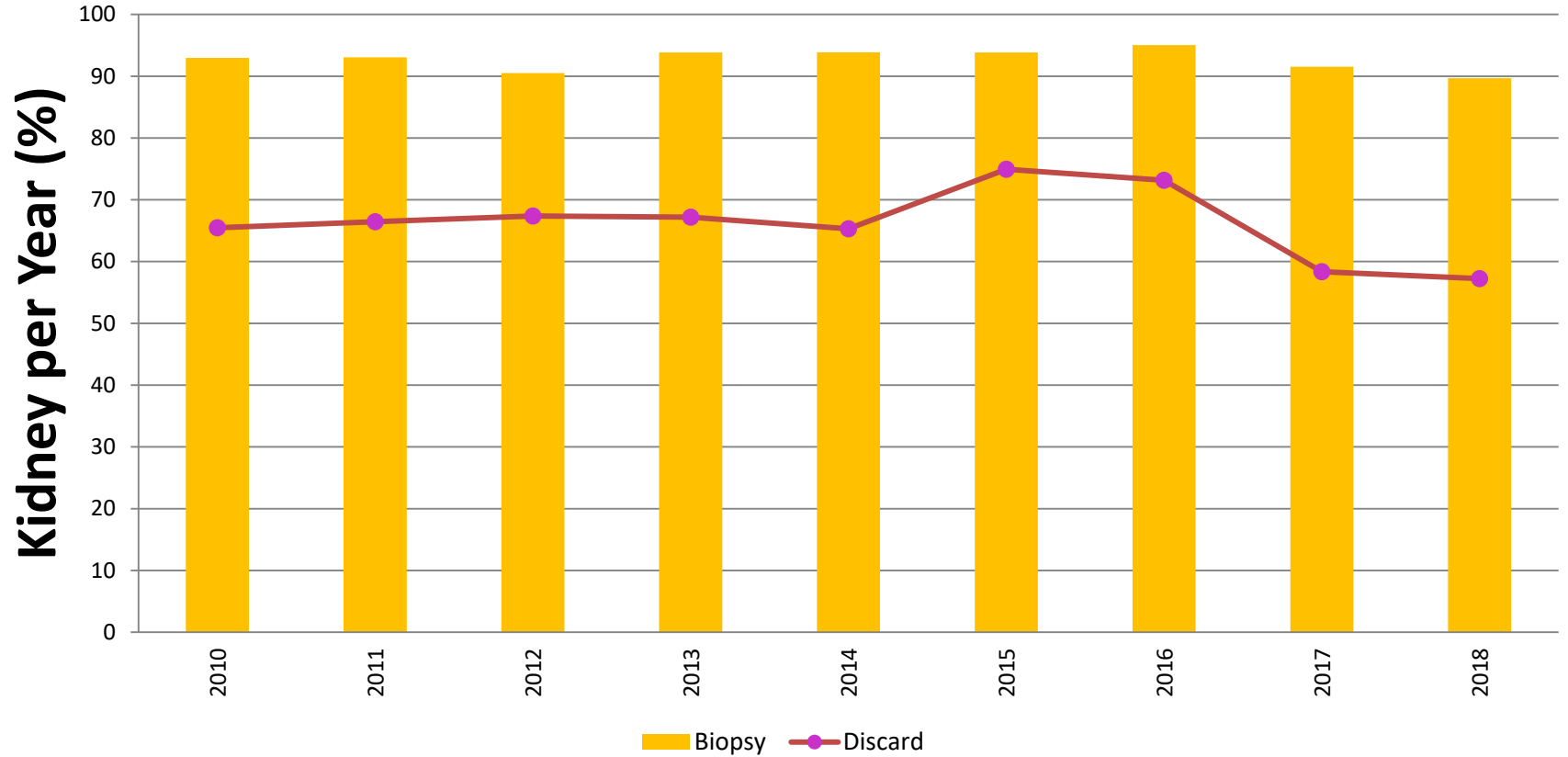
¹ Address correspondence to Lillian W. Gaber, M.D., Department of Pathology, University of Tennessee—Memphis, 899 Madison Ave., Room 578—Main, Memphis, TN 38163.

Kidney Biopsy and Discard Rates over Time

% Procured Kidneys



Kidney Biopsy and Discard Rates by Year, KDPI>85



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

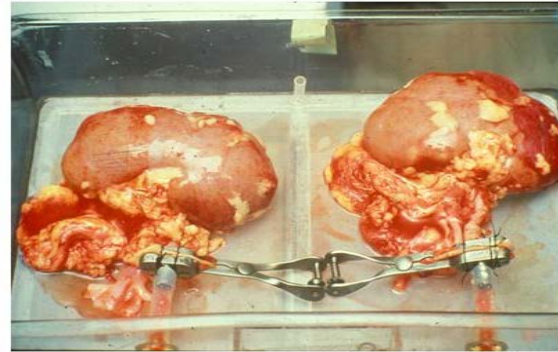


Logistics of Pumping

- Logistical practices
 - Pump location
 - Transport kidneys on pump across DSA boundaries
 - Optimize OR timing for commercial flights
 - Pump kidneys when extended CIT is anticipated



Waters medical systems RM3



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

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](https://doi.org/10.1111/ajt.14220)

2 Cannon et al. Machine perfusion: Not just for marginal kidney donors. Am Surg 2015; 81: 550–556

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!



WRTC DONOR ALLOCATION REVIEW SHEET

Date:	03/19/18
UNOS ID:	AFCP283
Hospital:	DCGW
Age/Sex/Race:	33Y/F/W
COD:	CNS Tumor
Donor Type:	SCD
ABO:	A
Ht/Wt/BMI	164cm/56.7kg/21.1
Admit CR:	0.5
Peak CR:	0.6
Terminal CR:	0.5
WIT if DCD	n/a
Biopsy	
<i>Not done.</i>	
Authorization	3/16/2018 15:23
Allocation Huddle	3/17/2018 16:58
Start of Kidney Allocation	3/17/2018 17:13
Enter OR	3/19/2018 15:43
Cross Clamp	3/19/2018 18:03
KDPI	22%
Admit/History:	
<p>Pt is a 33 yo F female with PMHx of newly diagnosed L parietal tumor s/p craniotomy 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 reading. Pt was transferred to floor after left parietal craniotomy for resection of lesion in the left parietal lobe until 3/14 where she was very anxious and complaining of headaches for which she underwent a CT at 12pm that was unremarkable. She then overnight started to seize and had a repeat CTH at 2240 that showed significant increased acute hemorrhage with extension into ventricles. The pt was brought to the ICU emergently, tachycardic in the 150s, hypertensive in the 100s-200s/110s with two dilated and unresponsive pupils and starting to become hypoxic. The pt was subsequently emergently intubated, given 23% hypertonic saline push, and an EVD was placed at bedside. Heme/Onc 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 declared Brain Dead on 03/16/18 @ 1239 based on clinical and apnea exams. ***Pt will be considered OPO increased risk due to pt's brain tumor being diagnosed as either an anaplastic oligodendroglioma or anaplastic astrocytoma, differential pending molecular analysis later this week. Prelim report attached to donormet**** *Exercise induced asthma and light case of asthma when she was a child, used inhaler prior to strenuous workouts. **Noted in chart: undiagnosed factor XI deficiency **</p>	

ORGAN

R Kidney

DCCH
DCGU
DCGW
DCWR
VAFH

OUTCOME:	Seq#	TRANSPLANT CENTER
Transplanted	-	DCGU

Allocated w/pancreas.

L Kidney

DCCH Declined
DCGU Accepted
DCGW Accepted
DCWR Declined
VAFH Declined

OUTCOME:	Seq#	TRANSPLANT CENTER
Transplanted	3	DCGU

Pancreas

DCGU Accepted
VAFH Not offered

OUTCOME:	Seq#	TRANSPLANT CENTER
Transplanted	1	DCGU

VAFH pts screened off for 16.

Liver

DCGU Accepted

OUTCOME:	Seq#	TRANSPLANT CENTER
Transplanted	16	DCGU

Heart

DCCH Not offered
DCWH Declined
VAFH Declined

OUTCOME:	Seq#	TRANSPLANT CENTER
Research	0	No recipient located

DCCH pts screened off for 2 16 or 73.

R Lung

VAFH Declined

OUTCOME:	Seq#	TRANSPLANT CENTER
Transplanted	234	FLUF

L Lung

VAFH Declined

OUTCOME:	Seq#	TRANSPLANT CENTER
Transplanted	234	FLUF

Intestine

DCGU Not offered

OUTCOME:	Seq#	TRANSPLANT CENTER
Research	0	No recipient located

DCGU pts screened off for 2, 16 or 19.

WRTC DONOR ALLOCATION REVIEW SHEET

Date: 04/21/18
 UNOS ID: **AFDS353**
 Hospital: DCGU
 Age/Sex/Race: 65/F/W
 COD: CVA/Stroke
 Donor Type: ECD
 ABO: A
 Ht/Wt/BMI: 5.3Ft-In/205lbs/36.3
 Admit CR: 1.11
 Peak CR: 1.18
 Terminal CR: 0.64
 WIT if DCD: n/a

Biopsy
 RT: Glomeruli sclerosis 28% 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%

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 **86%**

Admit/History:
 65yo/F/W with a PMHx HTN. Last know normal ~2130 eveing of (4/17). 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 CTH showed diffuse SAH concentrating in the L ambient/interpeduncular/suprasellar cistern with + intraventricular blood and dilation of the temporal horns and 4th ventricle. She was transferred to DCGU for further management. ICP14 after EVD was inserted in ICU (previously ICP was 30). At time of referral, patient is GCS3, no sedation. PERL sluggish 4mm. +cough, no gag. Family are aware of prognosis. Pt pronounced BD at 1214 on 4/19/2018 via clinical exam and apnea test where CO2 rose from 41 to 70.

ORGAN
R Kidney DCCH Not offered
 DCGU Declined
 DCGW Declined
 DCWR Declined
 VAFH Declined

L Kidney DCCH Not offered
 DCGU Declined
 DCGW Declined
 DCWR Declined
 VAFH Declined

Pancreas DCGU Not offered
 VAFH Not offered

Liver DCGU Accepted

Heart DCCH Not offered
 DCWH Not offered
 VAFH Not offered

R Lung VAFH Not offered
L Lung VAFH Not offered

Intestine DCGU Not offered

OUTCOME: Transplanted	Seq# 994	TRANSPLANT CENTER NJHK
DCCH pts screened off for 16 or 101.		
OUTCOME: Transplanted	Seq# 4424	TRANSPLANT CENTER NYUC

OUTCOME: Not recovered	Seq# 0	TRANSPLANT CENTER Poor Organ Function
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OUTCOME: Transplanted	Seq# 4	TRANSPLANT CENTER DCGU
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OUTCOME: Research	Seq# 0	TRANSPLANT CENTER Age/Function
Research only at DCGW.		

OUTCOME: Not recovered	Seq# 0	TRANSPLANT CENTER Poor Organ Function
OUTCOME: Not recovered	Seq# 0	TRANSPLANT CENTER Poor Organ Function

OUTCOME: Not recovered	Seq# 0	TRANSPLANT CENTER Poor Organ Function
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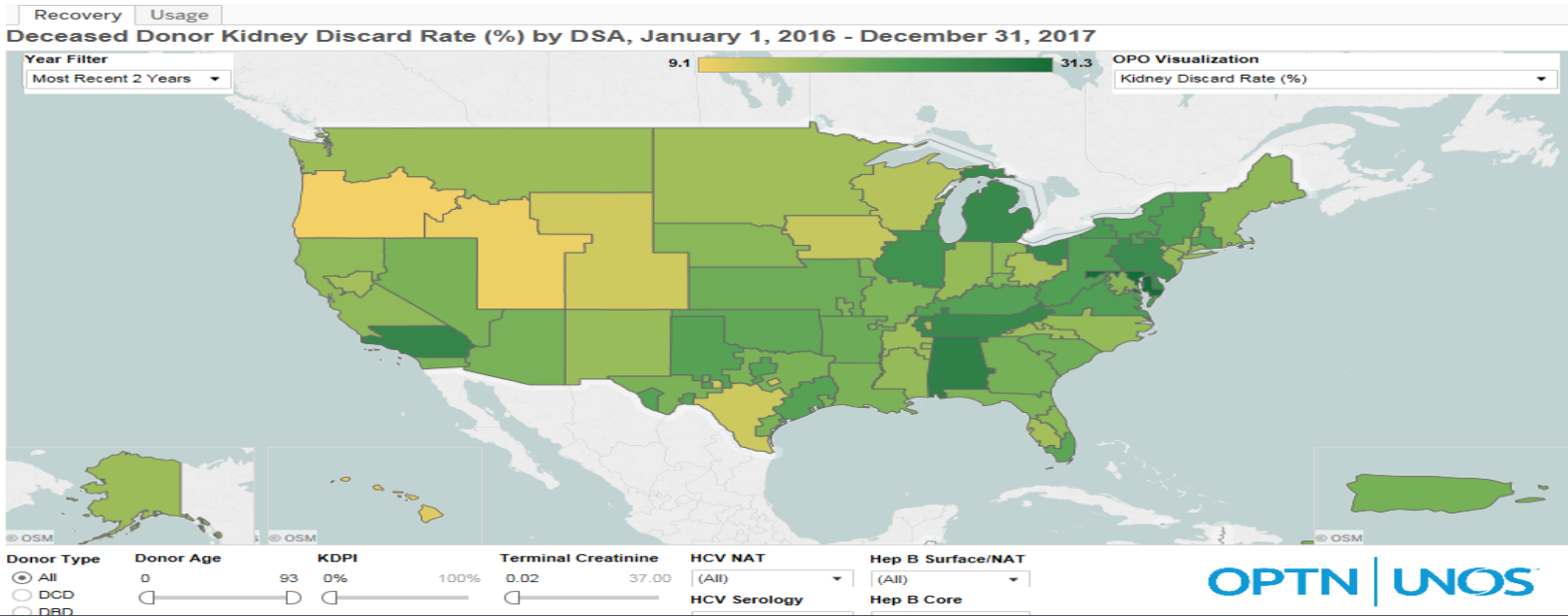
Recovery and Usage Maps (RUM) Report

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.

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

Have feedback or questions?
dataportalfeedback@unos.org

Authenticated as external\13704 - welcome DCGU-TX1 member!



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 → limitations of Behavioral Health, Assessment from next of kin, etc.

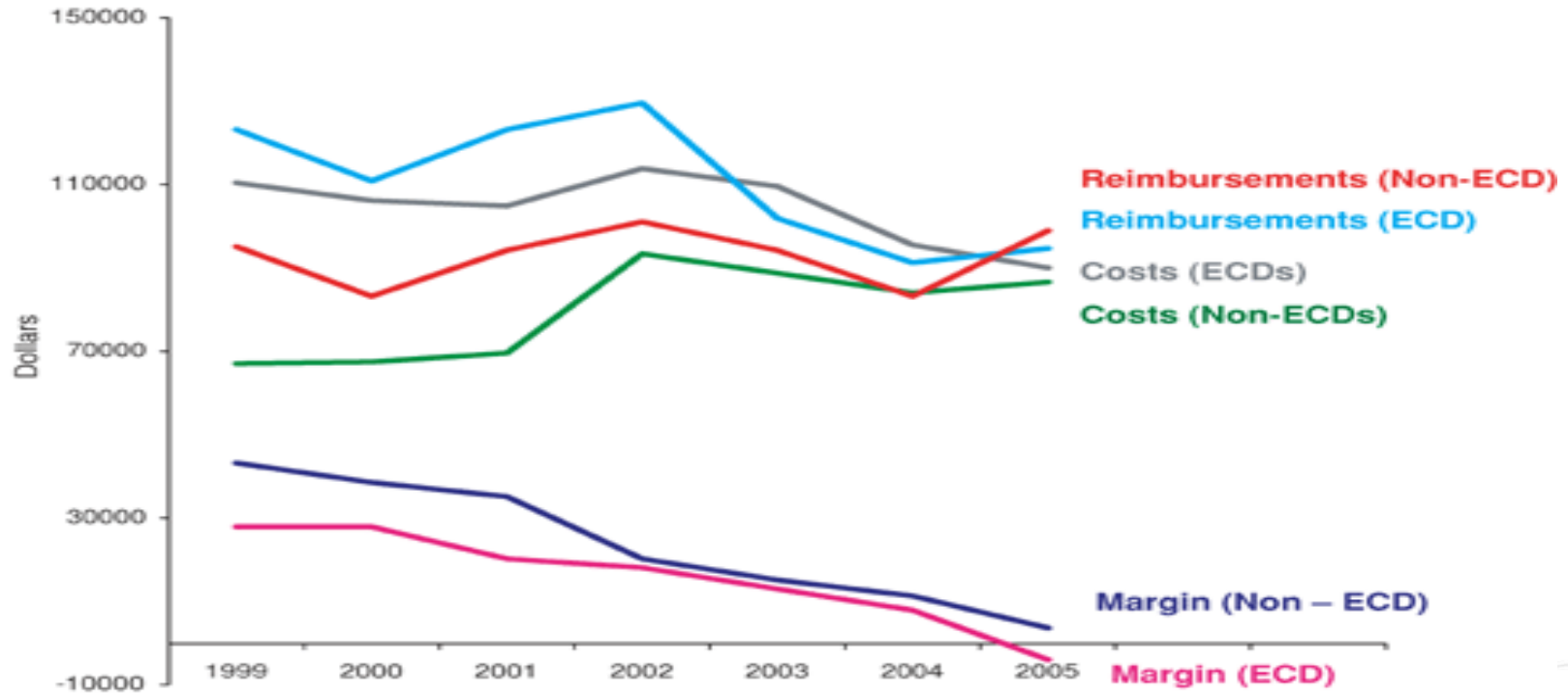
Center acceptance behaviors

- 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



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

Parameter	Deceased Donor		Living Donor	
	Estimate	P-Value	Estimate	P-Value
Recipient Characteristics				
EPTS Score Rank				
0-20	Reference			
21-50	\$1,096	0.005	-\$461	0.25
51-85	\$2,292	<.0001	\$278	0.61
85-100	\$5,257	<.0001	\$1,312	0.23
Female	-\$1,589	<.0001	-\$469	0.18
Race				
Caucasian	Reference			
Black	-\$434	0.23	\$2,011	0.03
Other	\$6,588	<.0001	-\$997	0.17
BMI				
<18.5	\$1,819	0.075	-\$95	0.93
18.5-24.9	Reference			
25-29.9	\$1,062	0.003	\$587	0.16
30-35	\$2,292	<.0001	\$1,814	0.0001
>35	\$2,037	0.0001	\$2,139	0.001
Unknown	\$4,420	0.006	\$10,263	<.0001

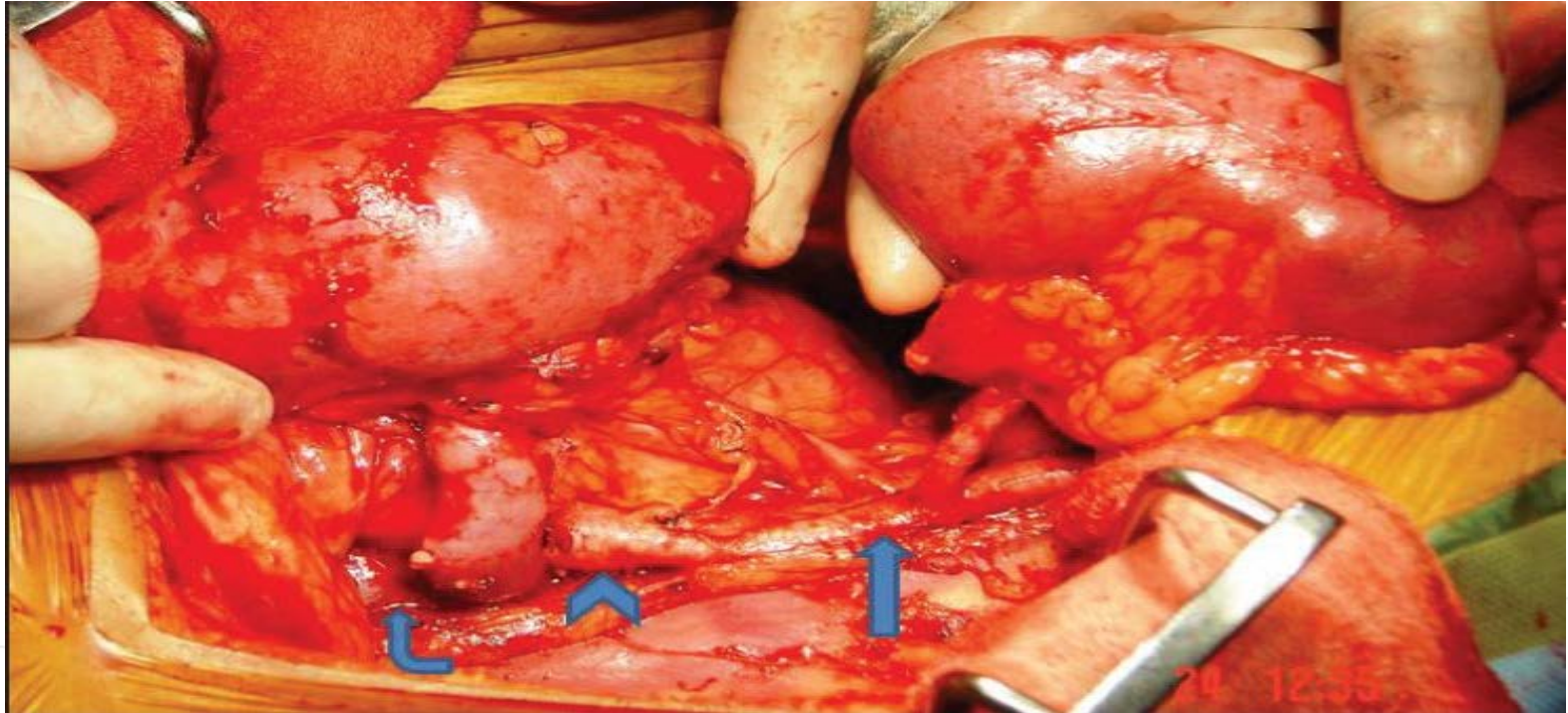
Economic Considerations - Recipient

Parameter	Deceased Donor		Living Donor	
	Estimate	P-Value	Estimate	P-Value
Cause of Disease				
Diabetes	Reference			
Hypertension	\$1,280	0.004	\$2,582	<.0001
Glomerulonephritis	-\$451	0.36	-\$1,980	0.0006
Polycystic Kidney Disease	-\$1,776	0.005	-\$2,105	0.002
Other	-\$277	0.56	-\$690	0.21
Peripheral Vascular disease	-\$436	0.56	\$2,231	0.02
Working at Transplant				
No	Reference			
Yes	-\$1,923	<.0001	-\$2,690	<.0001
Unknown	-\$4,819	<.0001	-\$7,594	<.0001
PRA/cPRA				
0-20	Reference			
21-50	\$3,638	<.0001	\$4,700	<.0001
51-80	\$5,558	<.0001	\$8,080	<.0001
81-90	\$5,002	<.0001	\$10,355	<.0001
91-97	\$8,785	<.0001	\$13,230	<.0001
98_100	\$9,097	<.0001	\$17,784	<.0001

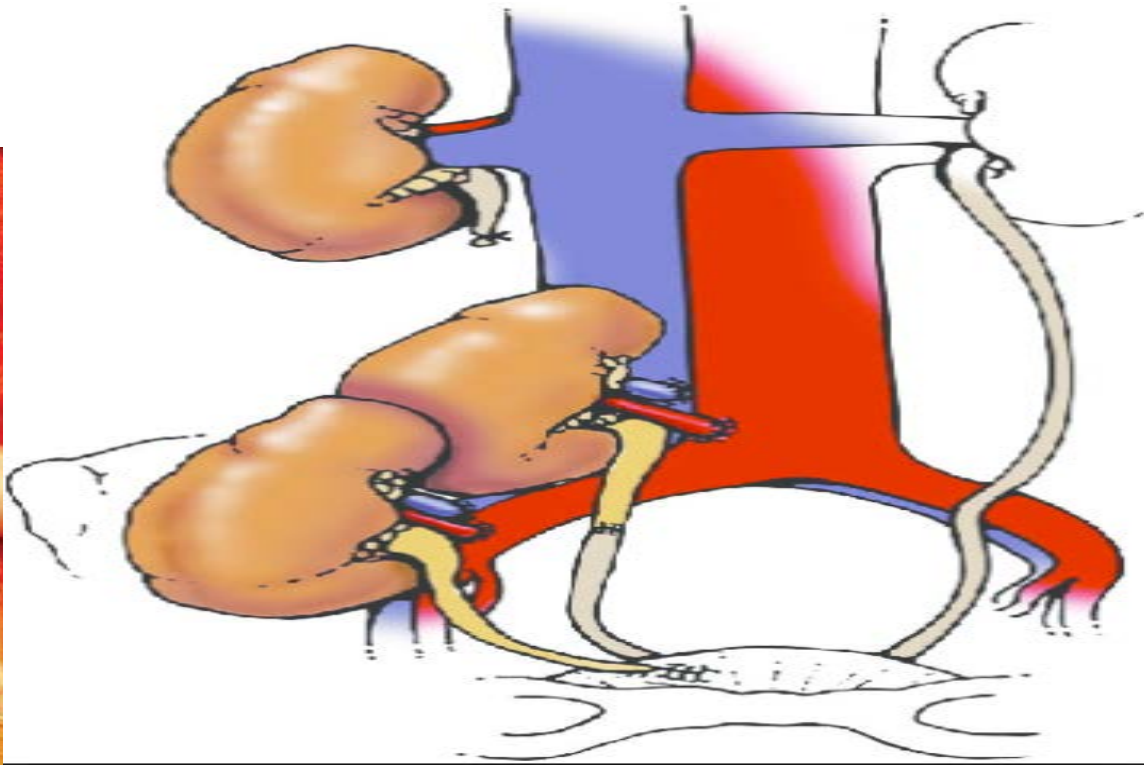
Economic Considerations - Donor

Donor Characteristics	Deceased Donor		Living Donor	
	Estimate	P-Value	Estimate	P-Value
Parameter				
Age (per year)	\$62	<.0001	\$3	0.84
Female	-\$717	0.02	-\$818	0.02
Race				
Caucasian	Reference			
Black	-\$1,511	0.001	\$789	0.42
Other	\$2,595	<.0001	\$1,426	0.05
Diabetes	\$3,370	<.0001	-\$9,713	0.19
Hypertension	\$665	0.04	\$1,610	0.17
Donation after Cardiac Death	\$6,182	<.0001	--	--
Cause of death				
Anoxic Injury	Reference			
Cerebrovascular Accident	-\$3,040	<.0001	--	--
Head Trauma	-\$2,322	<.0001	--	--
CNS Tumor	-\$980	0.71	--	--
Other	-\$1,618	0.12	--	--
HLA o Mismatch	-\$4,332	<.0001	-\$3,799	<.0001
HLA o-DR Mismatch	-\$2,968	<.0001	\$426	0.34

Adult Dual Unilateral Kidney Transplant (DUKT) – High KDPI Donors



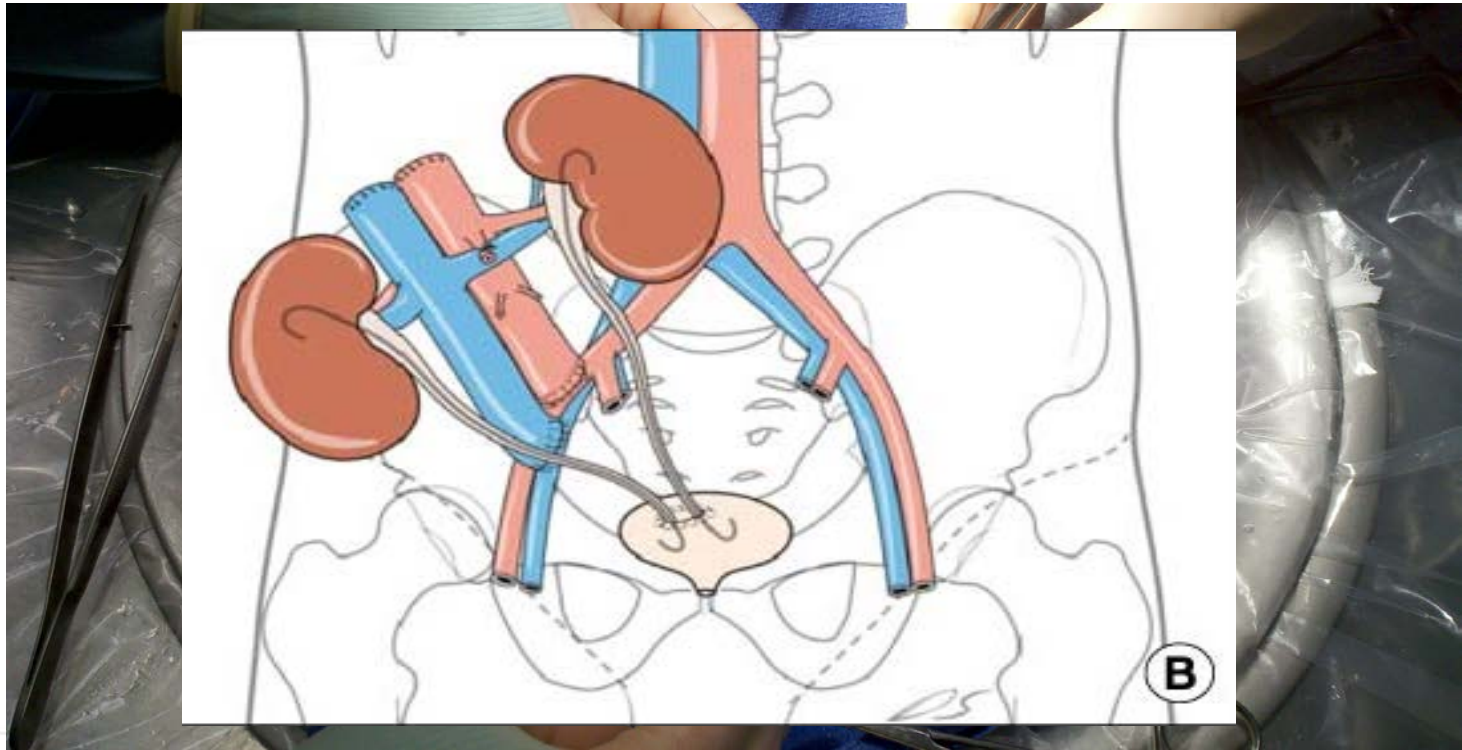
Adult Dual Unilateral Kidney Transplant (DUKT) – High KDPI Donors



Pediatric En-bloc Kidneys



Pediatric En-bloc Kidneys



Journal of Transplantation
Volume 2016 (2016), Article ID 2586761, 6 pages
<http://dx.doi.org/10.1155/2016/2586761>

Research Article

Intermediate-Term Outcomes of Dual Adult versus Single-Kidney Transplantation: Evolution of a Surgical Technique

Ana K. Islam,¹ Richard J. Knight,¹ Wesley A. Mayer,² Adam B. Hollander,² Samir Patel,³ Larry D. Teeter,⁴ Edward A. Graviss,⁴ Ashish Saharia,¹ Hemangshu Podder,¹ Emad H. Asham,¹ and A. Osama Gaber¹

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 Preczewski
- 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

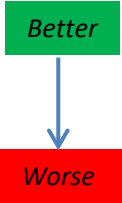
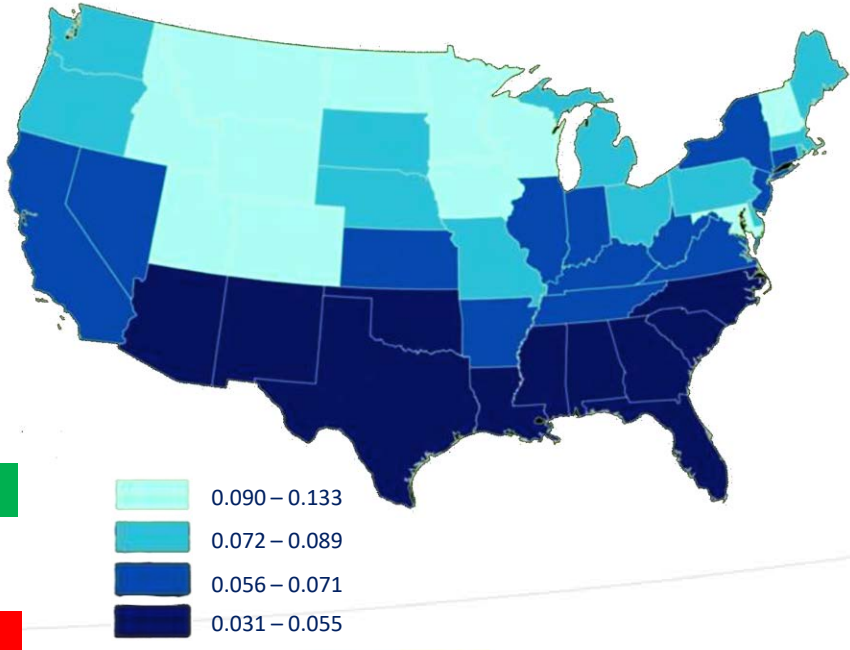
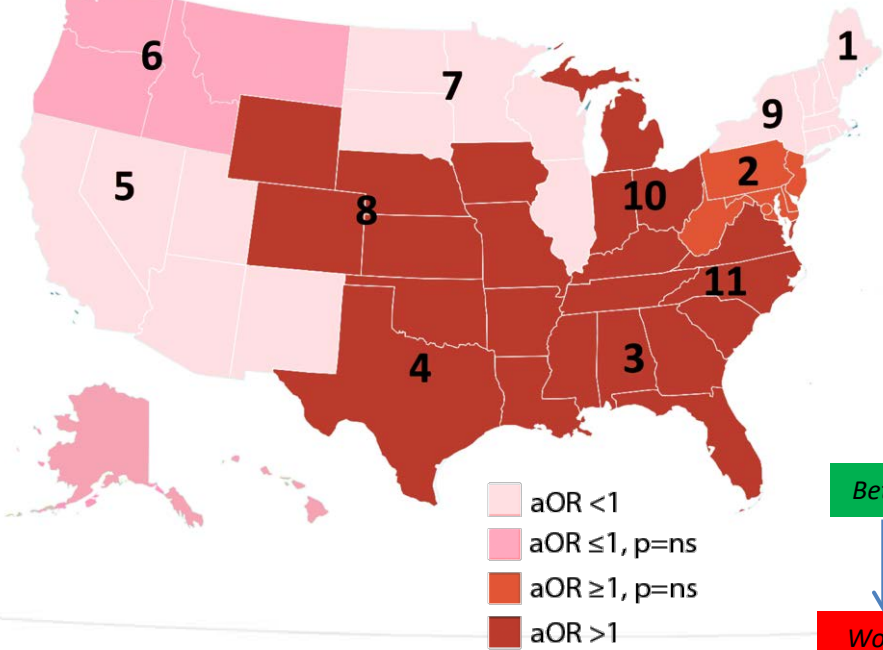
Broad Acceptance

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

Mohan et al. *Transplantation*. 2014 Sep 27;98(6):640-5
 Mohan et al. *Kidney Int*. 2018 Jul;94(1):187-198

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!

NAME	DISTANCE	TRANSPLANT VOLUME	TRANSPLANT RATE	OUTCOME ASSESSMENT
<p>OUTCOME ASSESSMENT</p> <p>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.</p>				

**Georgetown University
Medical Center**

Washington, DC

[View Summary Data](#)

[View Complete Report \(PDF\)](#)

Also transplants Intestine, Kidney-
Pancreas, Liver, Pancreas

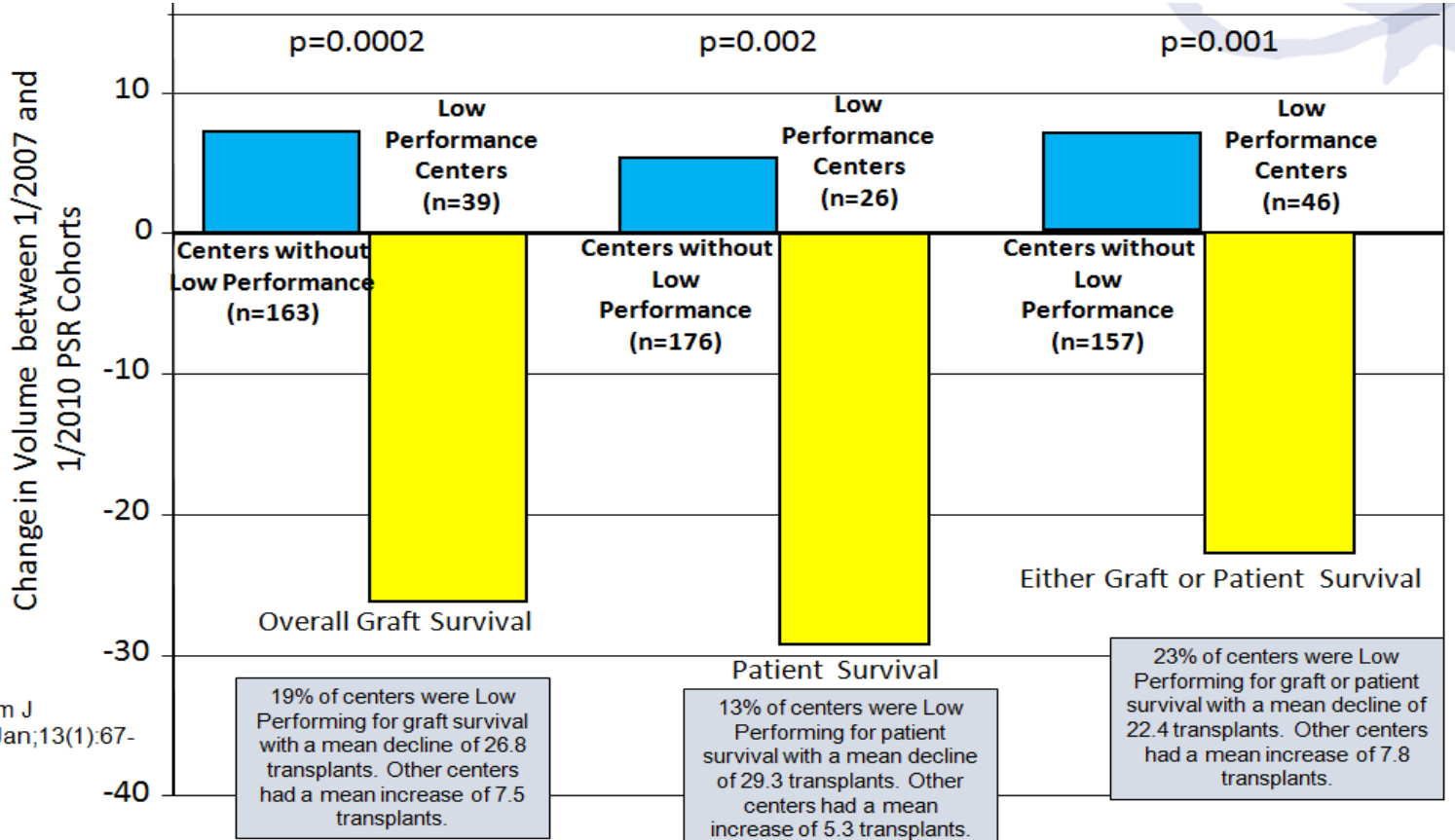
N/A

217
ADULTS

22.4
PER 100
PEOPLE PER
YEAR

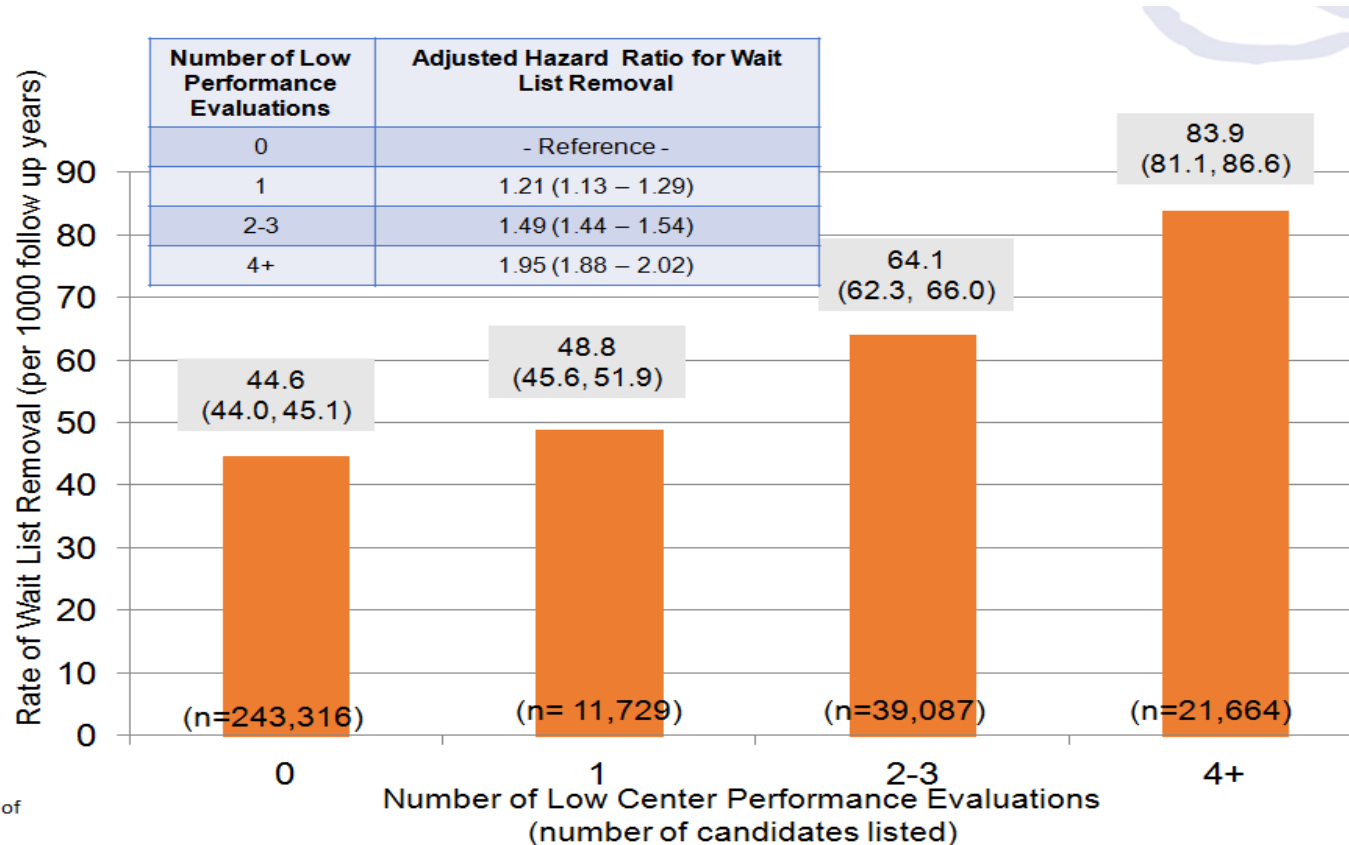
AS
EXPECTED

Consequences, Consequences, Consequences!

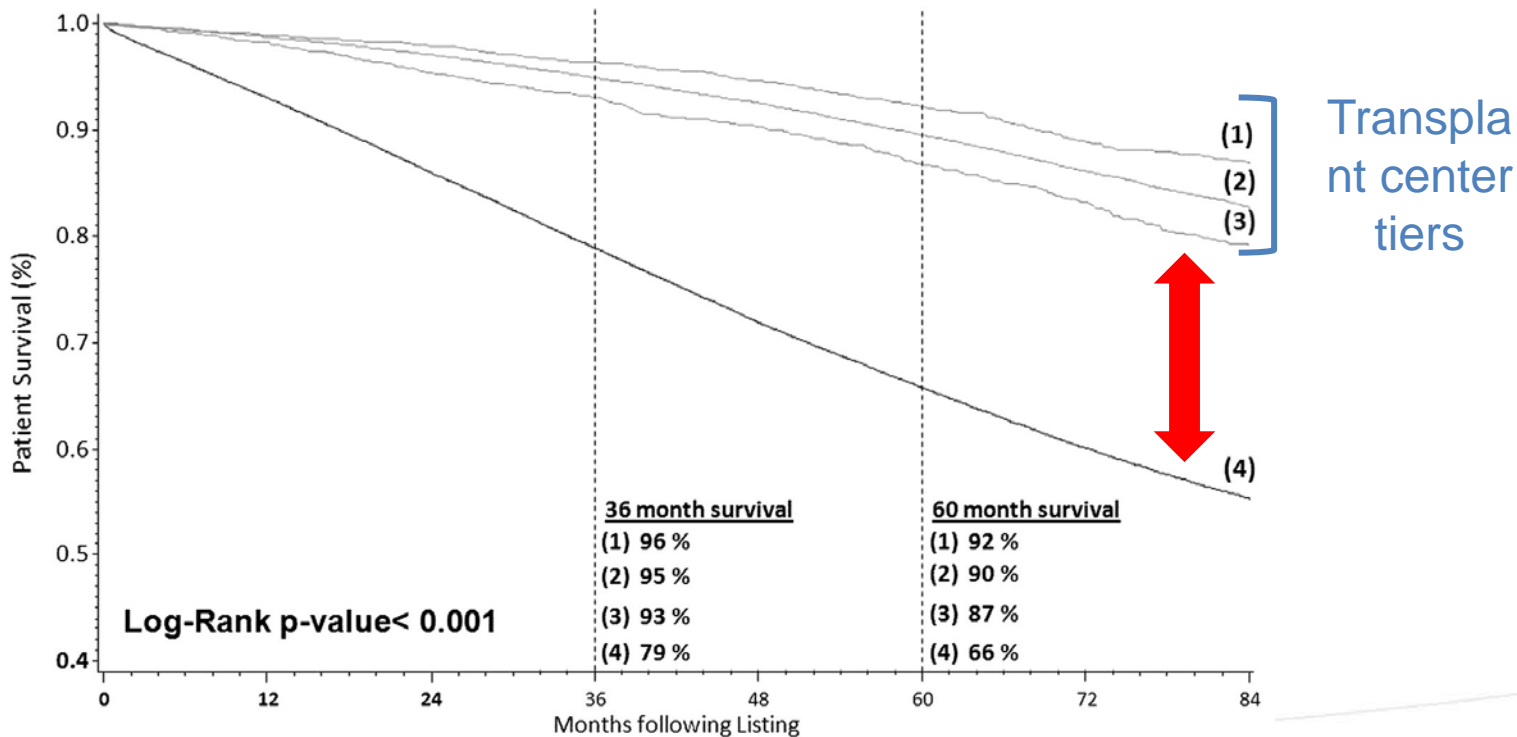


Schold JD et al, Am J Transplant. 2013 Jan;13(1):67-75

Patients, Patients, Patients!

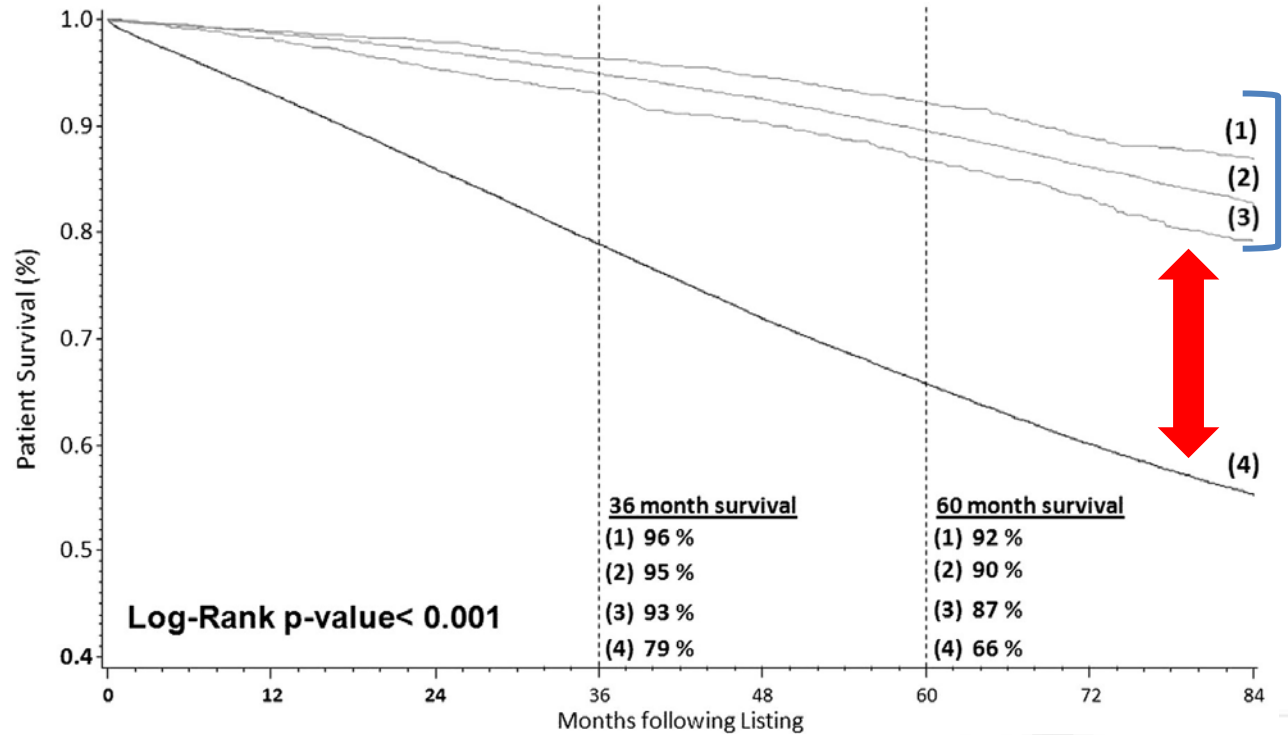


Do we really know our comparator?



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

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

What is the maximum donor age your center will consider?	80
Will your center consider kidneys from a donor with an unknown cause of death?	Yes
Will your center consider kidneys from a donor with a history of cancer (other than a primary brain tumor):	
• less than one year ago?	Yes
• 1 to 5 years ago?	Yes
• 6 to 10 years ago?	Yes
• more than ten years ago?	Yes
Will your center consider kidneys from a donor with a primary brain tumor that is:	
• malignant (i.e. Glioblastoma, Astrocytoma, Medulloblastoma)?	No
• non-malignant (i.e. Meningioma, Ependymoma, Neuroblastoma)?	Yes
Will your center consider kidneys from a donor with meningitis as the cause of death?	Yes
Will your center consider kidneys from a donor:	
• with evidence of current injection of non-prescription drugs?	Yes
• with history of past injection of non-prescription drugs?	Yes
• that is male who has had sex with another man in the last 5 years?	Yes
• who has engaged in sex in exchange for money/drugs in the last 5 years?	Yes
• who has been an inmate of a correctional system?	Yes
• 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 "high risk" based on OPO criteria)?	Yes
• with an unknown history (no historian available)?	Yes
Will your center consider kidneys from a donor with a positive result from any of the following infectious disease tests:	
• Hepatitis B Surface Antigen?	Yes
• Hepatitis B Core Antibody with no IGG/IGM testing?	Yes
• Hepatitis B Core Antibody with IGM testing?	Yes
• HBV NAT?	
• Anti-HCV?	Yes
• HCV NAT?	
• HTLV I or II?	No
• Syphilis?	Yes

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.

For donors aged:	<45 years	45-54 years	55-64 years	>64 years
With a history of hypertension and compliant with medication?	11 - 20 years	11 - 20 years	11 - 20 years	11 - 20 years
With a history of hypertension and period(s) of non-compliance within the last 5 years?	11 - 20 years	11 - 20 years	11 - 20 years	6 - 10 years
Who is an insulin dependent diabetic?	11 - 20 years	11 - 20 years	6 - 10 years	6 - 10 years
With diabetes and requires oral medication?	>20 years	>20 years	>20 years	>20 years

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

For donors aged:	<45 years	45-54 years	55-64 years	>64 years
With CPR?	>30 min	>30 min	>30 min	>30 min
Without CPR?	>30 min	>30 min	>30 min	>30 min

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

For donors aged:	<45 years	45-54 years	55-64 years	>64 years
What is the maximum acceptable peak serum creatinine level?	8 mg/dl	8 mg/dl	3 mg/dl	3 mg/dl
What is the maximum cold ischemic time (based on arrival time) on cold storage?	36 hrs	30 hrs	30 hrs	24 hrs
What is the maximum acceptable percentage of glomerular sclerosis for a biopsied kidney?	30 %	30 %	30 %	30 %

Know Your Data!!!



SCIENTIFIC
REGISTRY OF
TRANSPLANT
RECIPIENTS

Georgetown University Medical Center

Center Code: DCGU

Transplant Program (Organ): Kidney

Release Date: January 5, 2018

Based on Data Available: October 31, 2017

SRTR Program-Specific Report
Feedback?: SRTR@SRTR.org
1.877.970.SRTR (7787)
<http://www.srtr.org>

B. Waiting List Information

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

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

Know Your Data!!!

Medium-KDRI Donors (1.05 < KDRI < 1.75)

Number of Offers	9,167	16,564	146,025	1,021,475
Number of Acceptances	73	129	803	6,593
Expected Acceptances	25.9	66.7	924.5	6,581.3
Offer Acceptance Ratio*	2.69	1.91	0.87	1.00
95% Credible Interval**	[2.11, 3.33]	--	--	--

High-KDRI Donors (KDRI > 1.75)

Number of Offers	8,032	11,571	72,514	309,605
Number of Acceptances	34	37	155	1,119
Expected Acceptances	11.5	22.0	166.5	1,118.3
Offer Acceptance Ratio*	2.67	1.63	0.93	1.00
95% Credible Interval**	[1.87, 3.61]	--	--	--

Report of Organ Offers

My Data Files

Organ Offers Report TXC

My Visual Analytics

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

Documentation

Have feedback or questions?
dataportalfeedback@unos.org

Authenticated as external\13704 - welcome DCGU-TX1 member!

Organ Offers Dashboard Donors Accepted KI Match List LI Match List HR/HL Match List KP Match List LU Match

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

Excludes Offers After the Last Acceptor on the Match

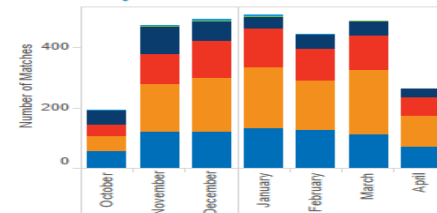
Listing Center

(All)

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

Donor Id	Match ID	Match Organ	Transplanted	Number of Records
AEJ1027	1068191	IN	Y	1
AEJ1069	1068631	KI	Y	100
	1068633	LI		10
	1068632	KP		1
AEJ1108	1068177	LI	Y	10
AEJ1132	1068182	IN		1
AEJ1214	1068213	HR		1
	1068261	KI	Y	1
AEJ1221	1068103	KI		100
AEJ1247	1068381	LI		1
AEJ1257	1068171	KI		100
AEJ1272	1068199	KP		1
AEJ1313	1068295	IN		1
AEJ1340	1068148	LI		1
AEJ1376	1068245	IN		1
AEJ2013	1068330	KI		1
AEJ2113	1068391	KI		100
AEJ2211	1068656	IN		1
AEJ2294	1068311	KP		1
AEJ2306	1068320	KI	Y	1

Matches by Month



Month

(All)

Match Organ

- HL
- HR
- IN
- KI
- LI

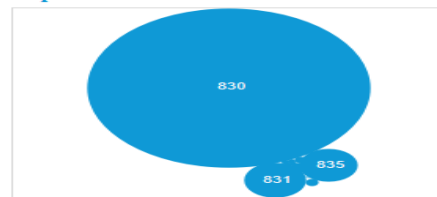
Offer Type

- (All)
- Local
- Regional
- National

Match Has Acceptance

- No
- Yes

Top Refusal Codes



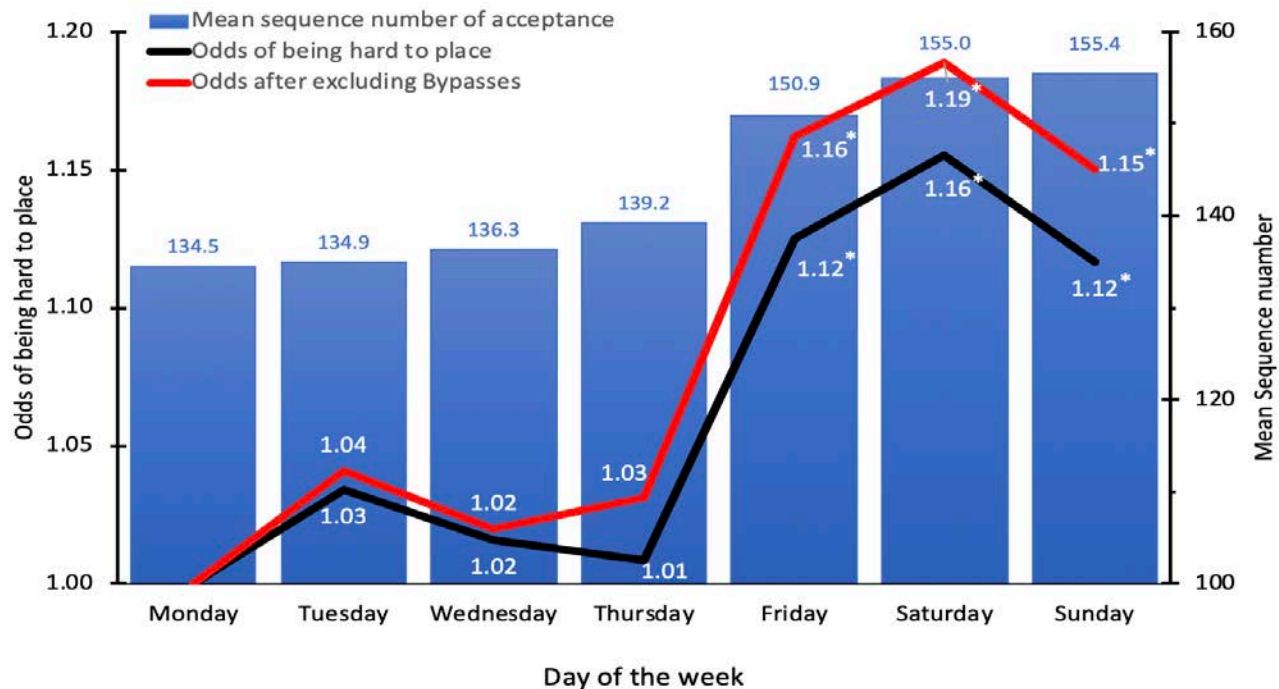
v1.2

Kidney Offer Acceptance Metrics: High Acceptance

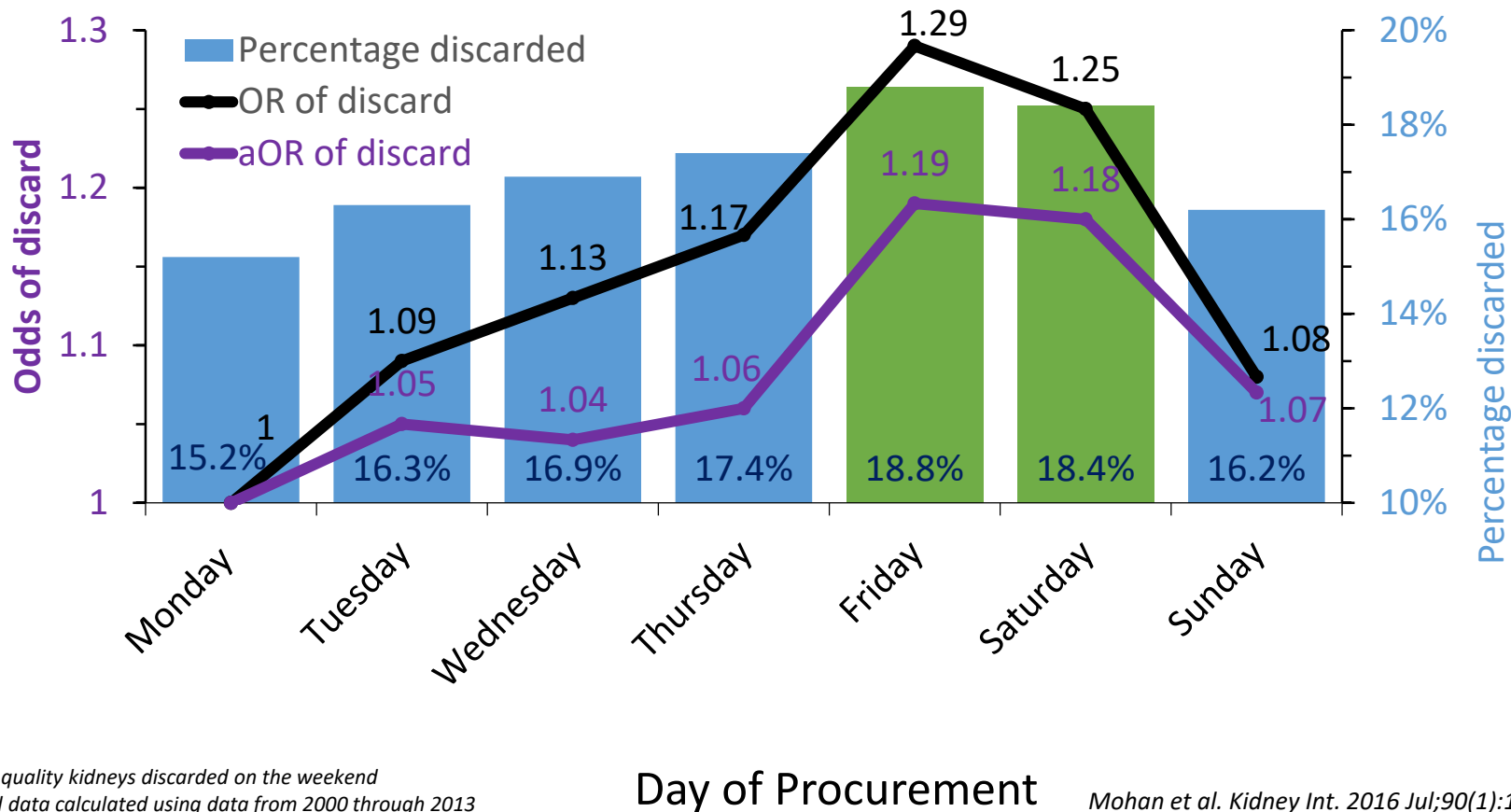
Offer Acceptance Ratios Across Donor Characteristics

Donor Characteristics	Number of Offers	Number of Acceptances	Expected Acceptances	Offer Acceptance Ratio
Overall	2781	93	21.2	4.09
KDRI: < 1.05	77	3	2.64	1.08
KDRI: 1.05-1.75	1681	54	14.45	3.4
KDRI: > 1.75	1023	36	4.12	6.21
DCD Donor	262	10	1.14	3.82
PHS Increased Infectious Risk	839	26	4.38	4.39
HCV+	4	4	0.14	2.81
Weekend	824	30	6.26	3.87

Kidneys are harder to place on the weekend



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

Mohan et al. *Kidney Int.* 2016 Jul;90(1):157-63

Recipient Selection – New Allocation Categories

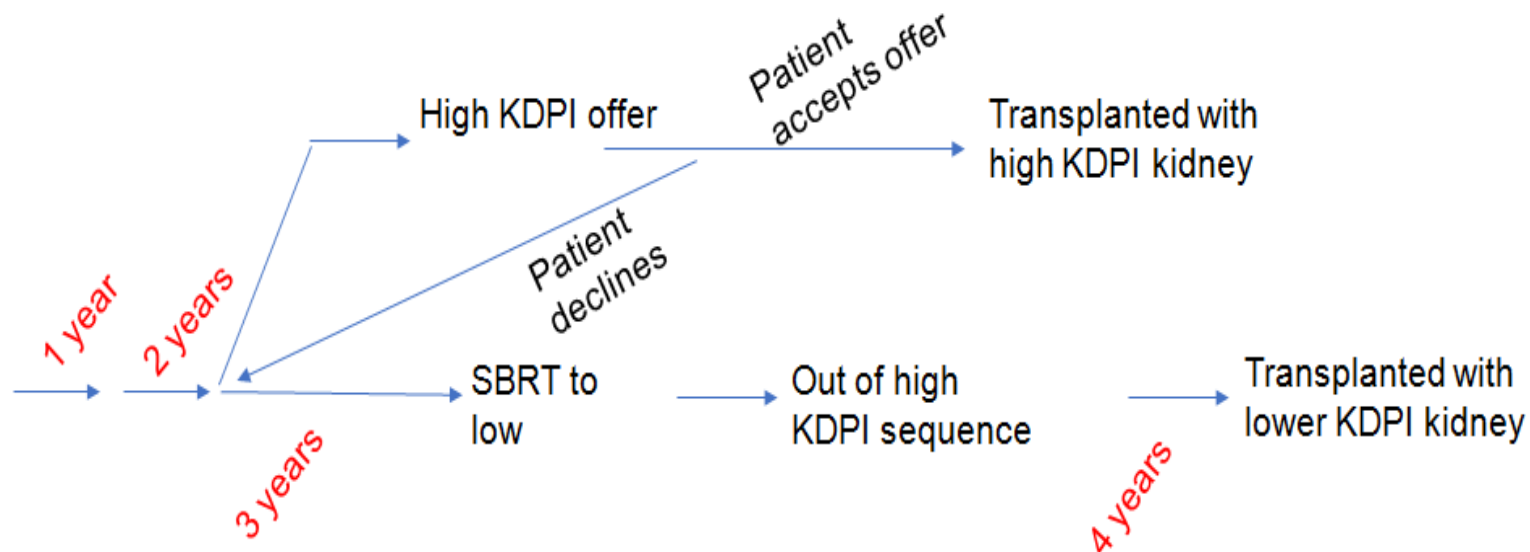
- Selection for expedited placement
 - New "EPTS" vs. pre-transplant survival for brevity matching
 - Candidates would "roll out" of the group with added waiting time
 - Greatest benefit from high KDPI kidneys is with rapid access
 - Once several years accrued or passed on multiple offers, roll out of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

Survival Benefit from Rapid Transplant (SBRT)

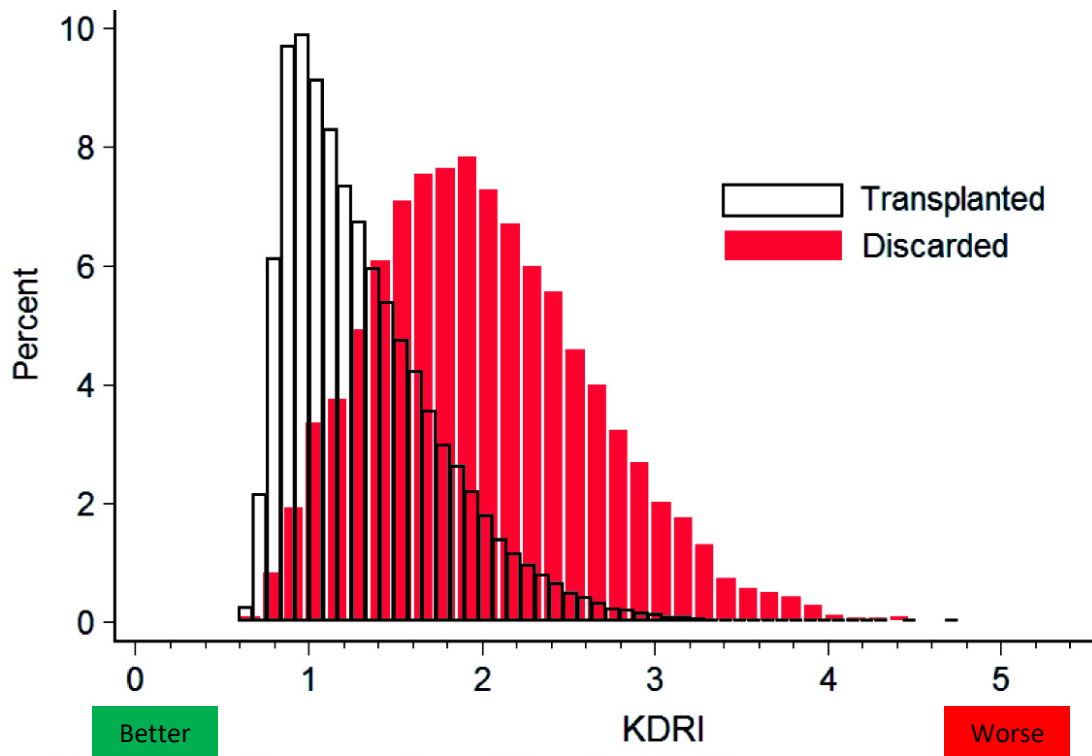
Proposed model

Patient meets inclusion criteria and consents.

↓
Patient listed



Excellent quality kidneys from deceased donors are being discarded



Mohan S et al. *Kidney Int.* 2018 Jul;94(1):187-198

Work Group 3: Research and Education

Co-Chairs: Sumit Mohan, Jesse Schold

Participants:

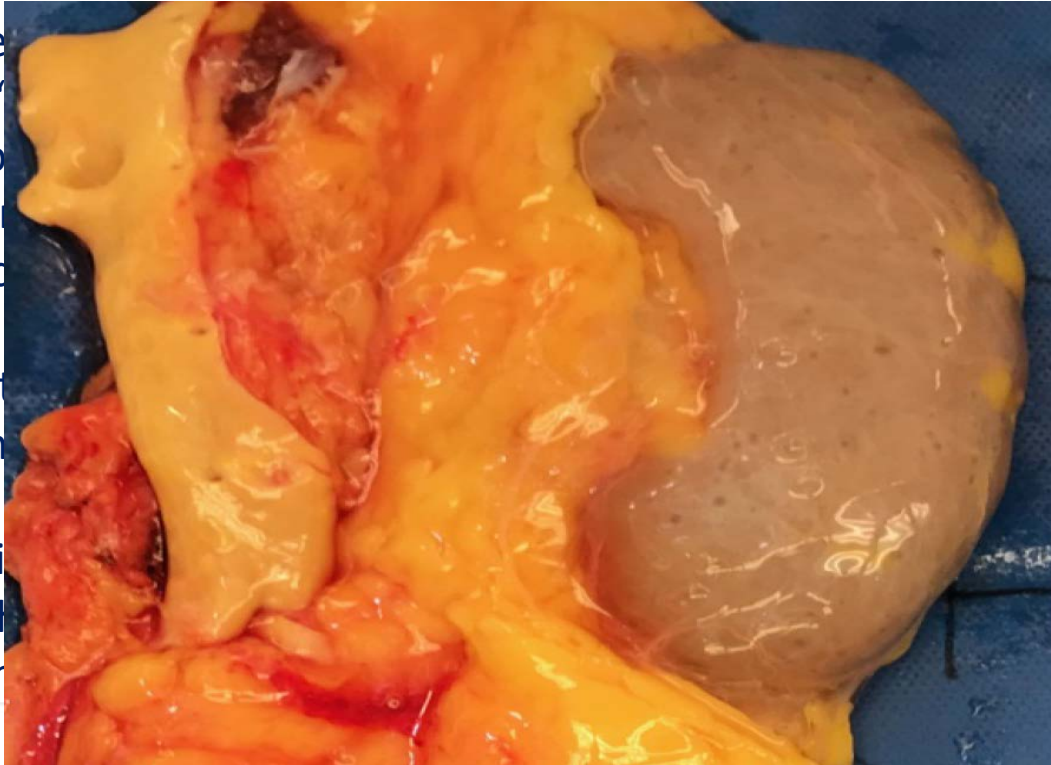
- Kevin C. Abbott
- Charles Alexander
- Anthony F. Bonagura
- Mariana C. Chiles
- Kevin Fowler
- Melissa Greenwald
- Leal C. Herlitz
- Ian R. Jamieson
- Liise K. Kayler
- Alan B. Leichtman
- Jonah Odim
- Chirag R. Parikh
- Marcus R. Pereira
- Andreas Price
- Kunam Reddy
- Alan I. Reed
- James R. Rodrigue
- 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 current practice is far from being a “gold standard”
 - Advocate for standardized biopsy techniques
 - Biopsy technique
 - Central reading
- Gross organ photography
 - There is some variability in donor net
 - Develop guidelines for grossing fatty tissue, etc.
 - Make postoperative



unclear – and very
standardized
kidneys on the
gradually removing
mandatory

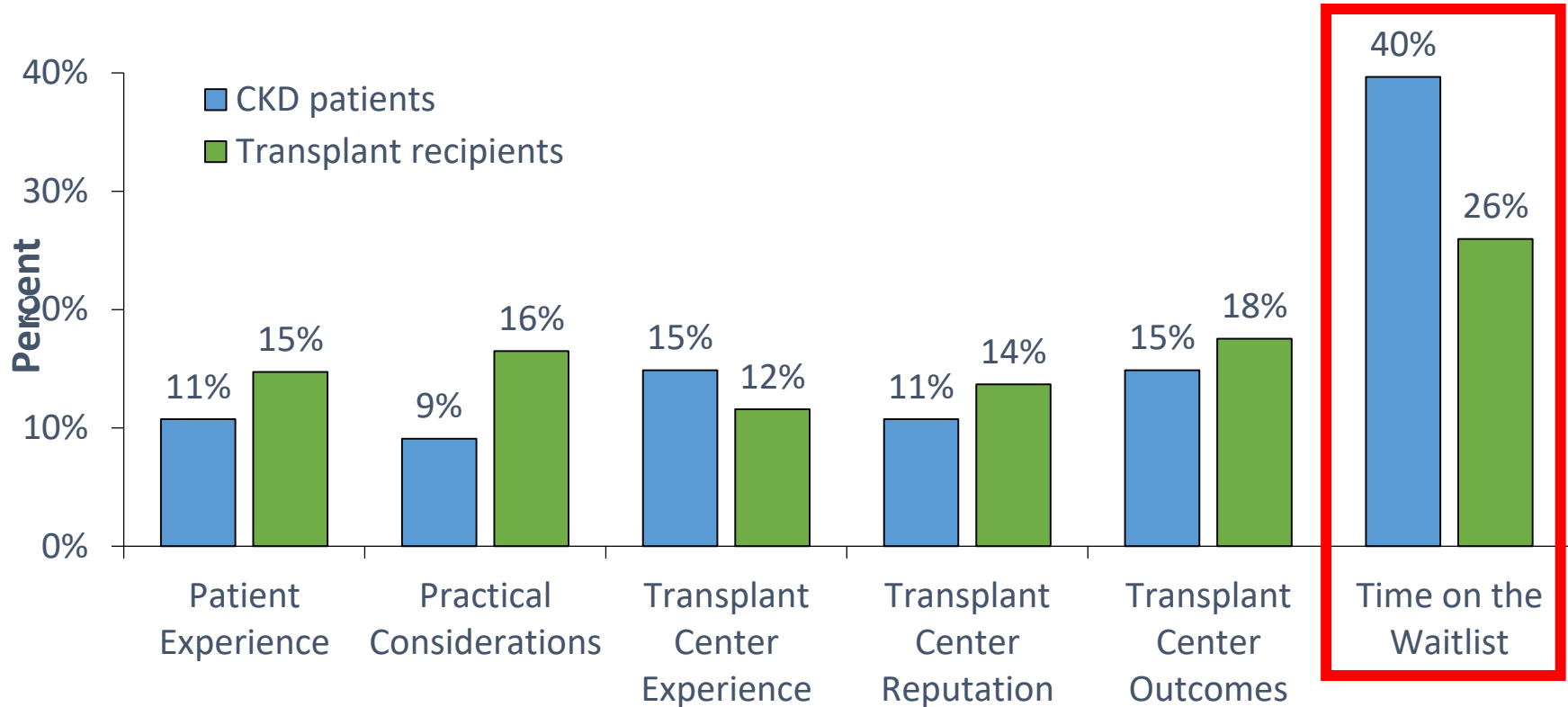
Recognition that Discard → Complex Issue

- 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

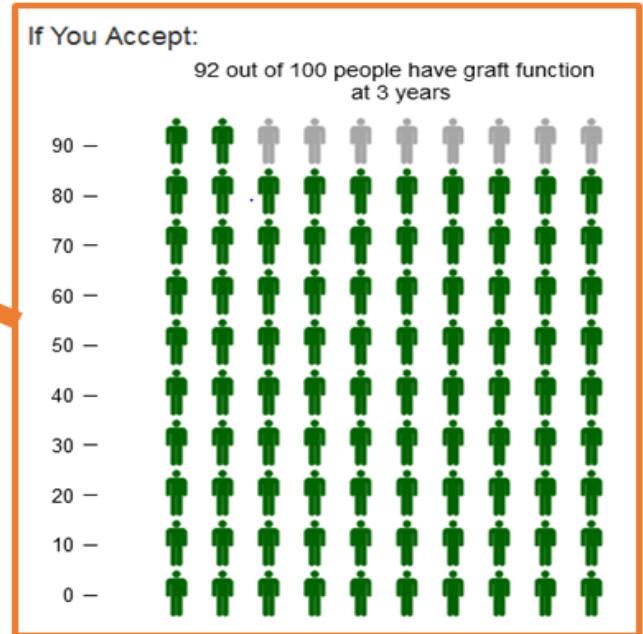
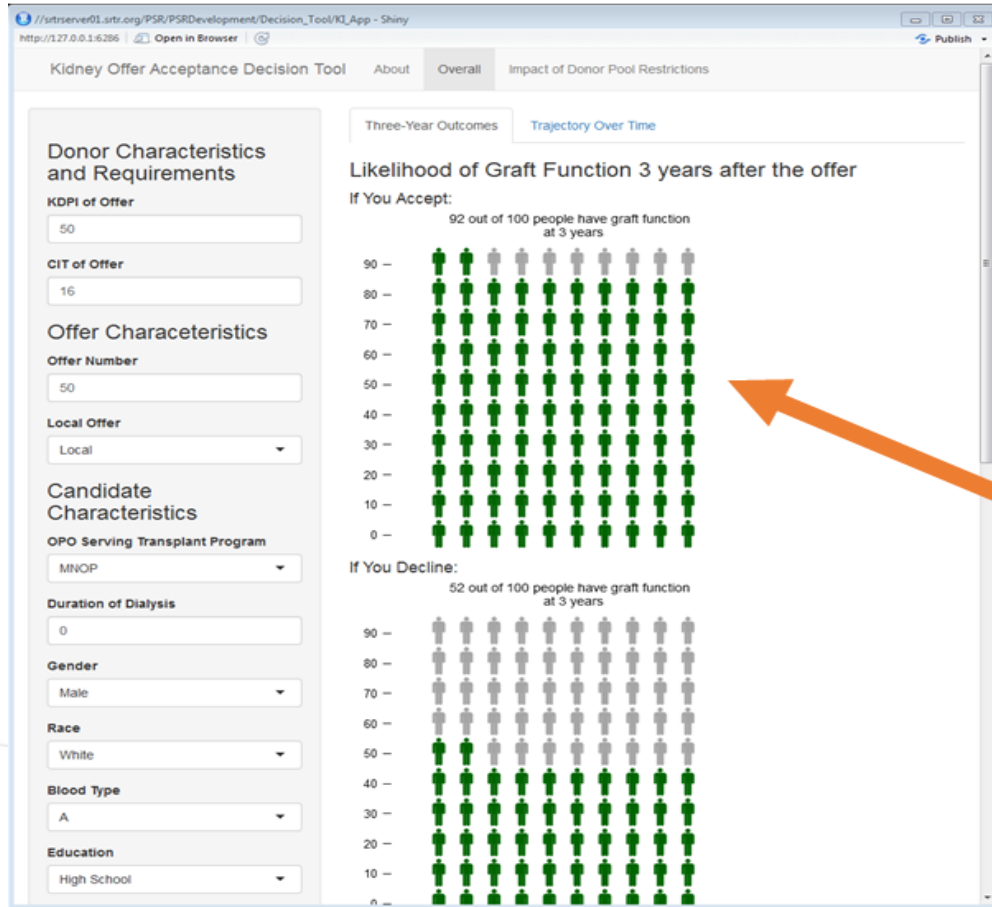


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TRANSPLANT
RECIPIENTS

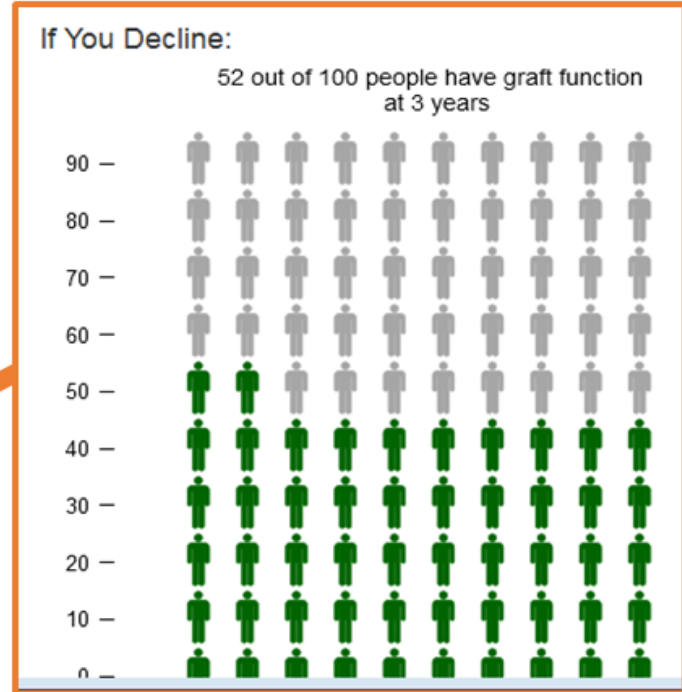
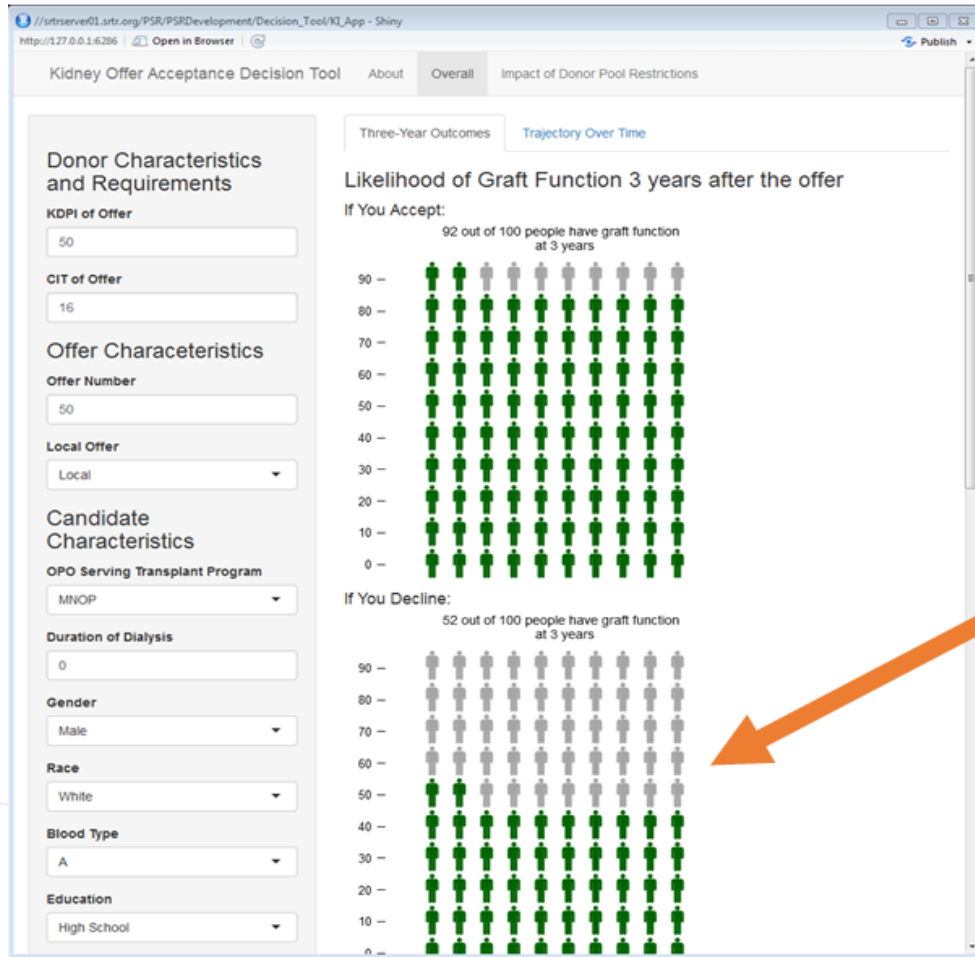
Offer Acceptance Decision Tool

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.

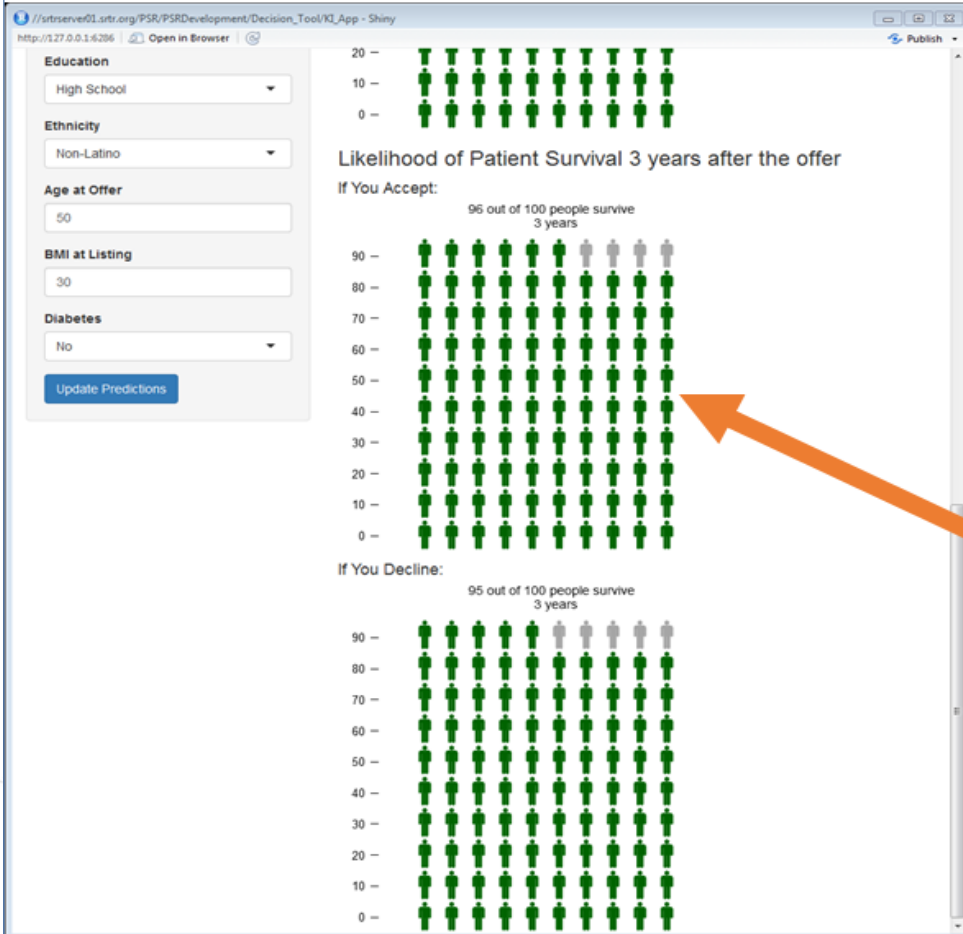
Offer Acceptance Decision Tool



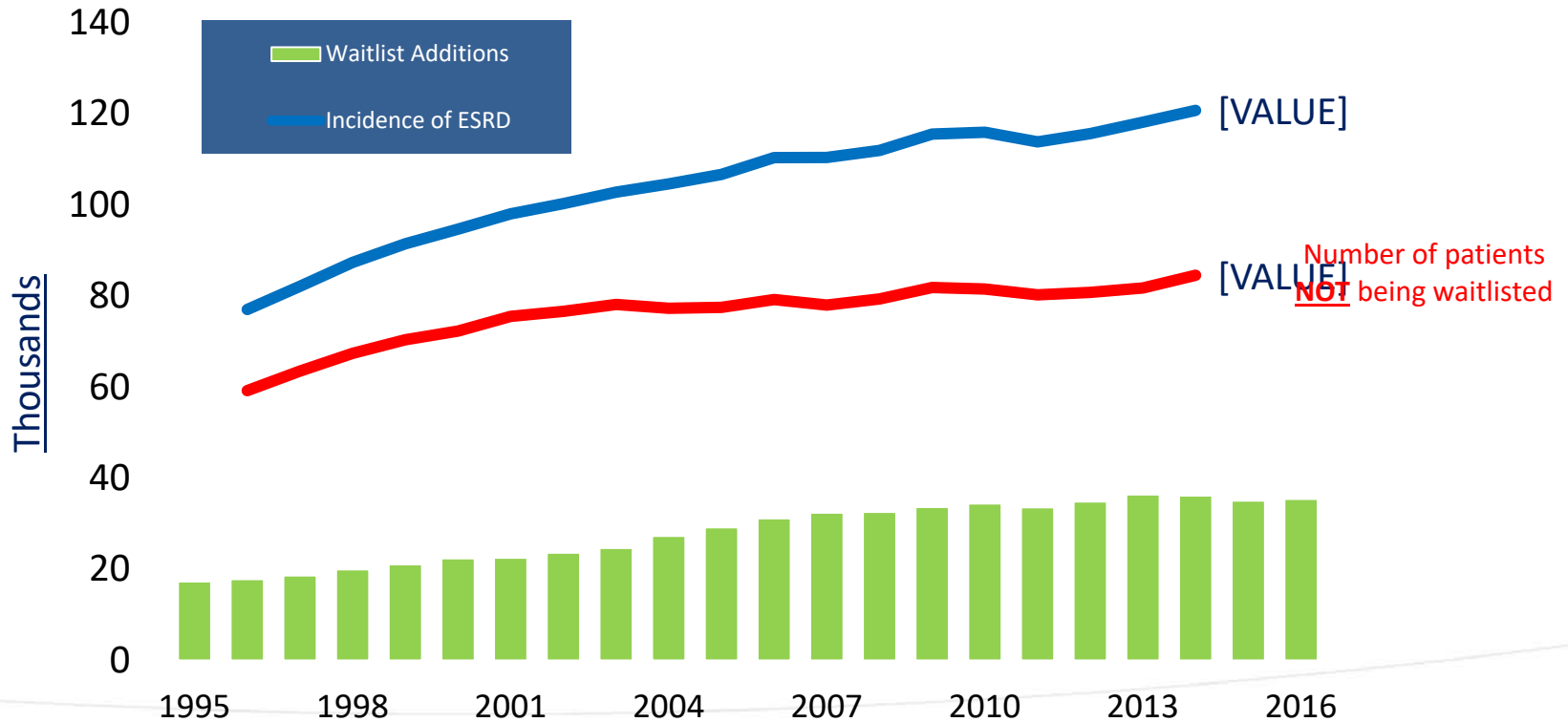
Offer Acceptance Decision Tool



Offer Acceptance Decision Tool



Growth in the need... and the waitlist





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!



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Transplant Institute