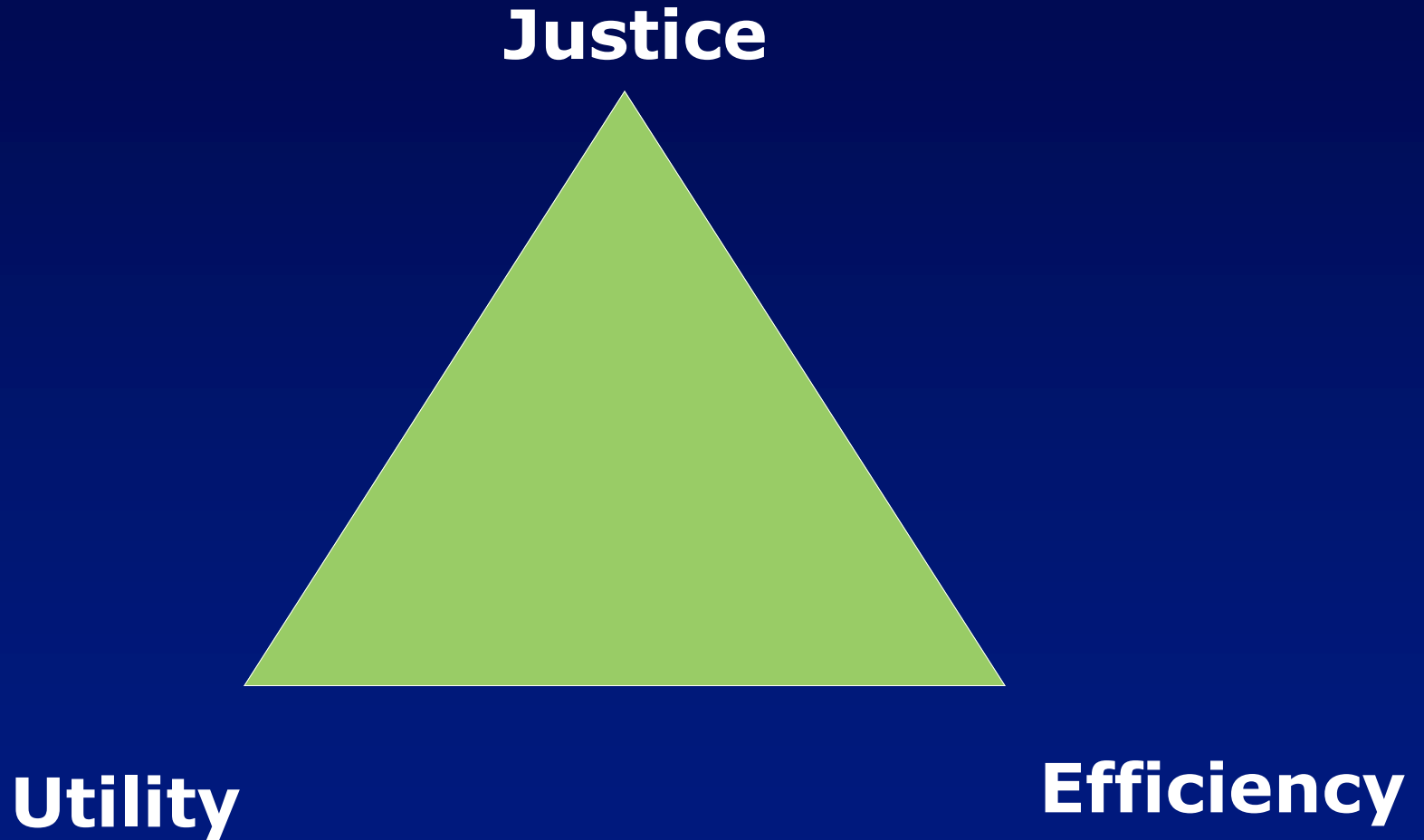


# **Kidney Allocation- Deceased Donor/Recipient Matching**

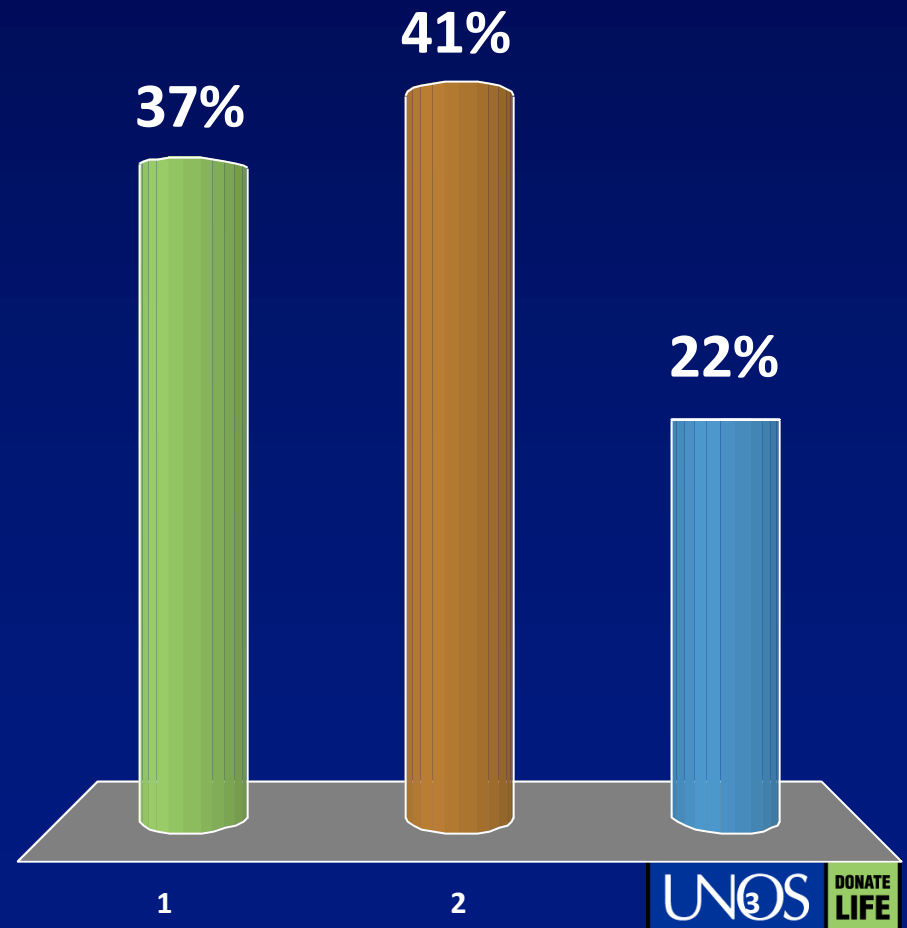
**Peter G Stock MD, PhD  
UCSF Department of Surgery**

# Three Sides to Allocation



# What factor would you consider the most important in the design of a new allocation system for kidneys?

1. Utility
2. Justice
3. Efficiency



# Different Allocation Factors

## Liver

- Serum creatinine
- Bilirubin
- INR
- Waiting time for tie-breakers

## Kidney

- Waiting time
- PRA
- HLA match
- ECD – alternative list

# Kidney Allocation

## SCD versus DCD

### Standard Criteria

#### Donor (SCD)

- Waiting time
- PRA (>80% get 4 pts = 4 years)
- HLA (1 point for each HLA DR match=1 year)

### Extended Criteria

#### Donor (ECD)

- Waiting time

# ECD – Extended Criteria Donor

## ■ ECD

- Donor Age
  - >60 alone
- Donor Age
  - >50 with two below:
    - Cr >1.5
    - HTN
    - CVA
- RR of graft failure >1.7 compared to the 'ideal' donor age 35 (16 – 17%)

# Upcoming Changes to the Kidney Allocation System

# Current Status

- June 2013: OPTN Board of Directors approves substantial revisions to the kidney allocation system

Phase I	Phase II
<ul style="list-style-type: none"><li>• Data updates required</li><li>• New reports released</li><li>• Calculators made available</li></ul>	<ul style="list-style-type: none"><li>• New allocation rules applied</li><li>• Variances turned off</li><li>• Payback system turned off</li></ul>
<i>Anticipated mid 2014</i>	<i>Anticipated end 2014</i>



# Preview of Expected Outcomes

- New system forecasted to result in:
  - Approximately 8,000 additional life years gained annually
  - Improved access for moderately and very highly sensitized candidates
  - Improved access for ethnic minority candidates
  - Comparable levels of kidney transplants at regional/national levels

# Major Proposal Components

- Replace SCD/ECD with KDPI
- Add longevity matching
- Increase priority for sensitized candidates/CPRA sliding scale
- Include pre-registration dialysis time
- Incorporate A<sub>2</sub>/A<sub>2</sub>B to B
- Base pediatric priority on KDPI
- Remove payback system
- Remove variances

# KDPI vs ECD

## ■ KDPI

- Donor age (c)
- Race/ethnicity
- Hypertension
- Diabetes
- Serum creatinine (c)
- COD CVA
- Height
- Weight
- DCD
- HCV

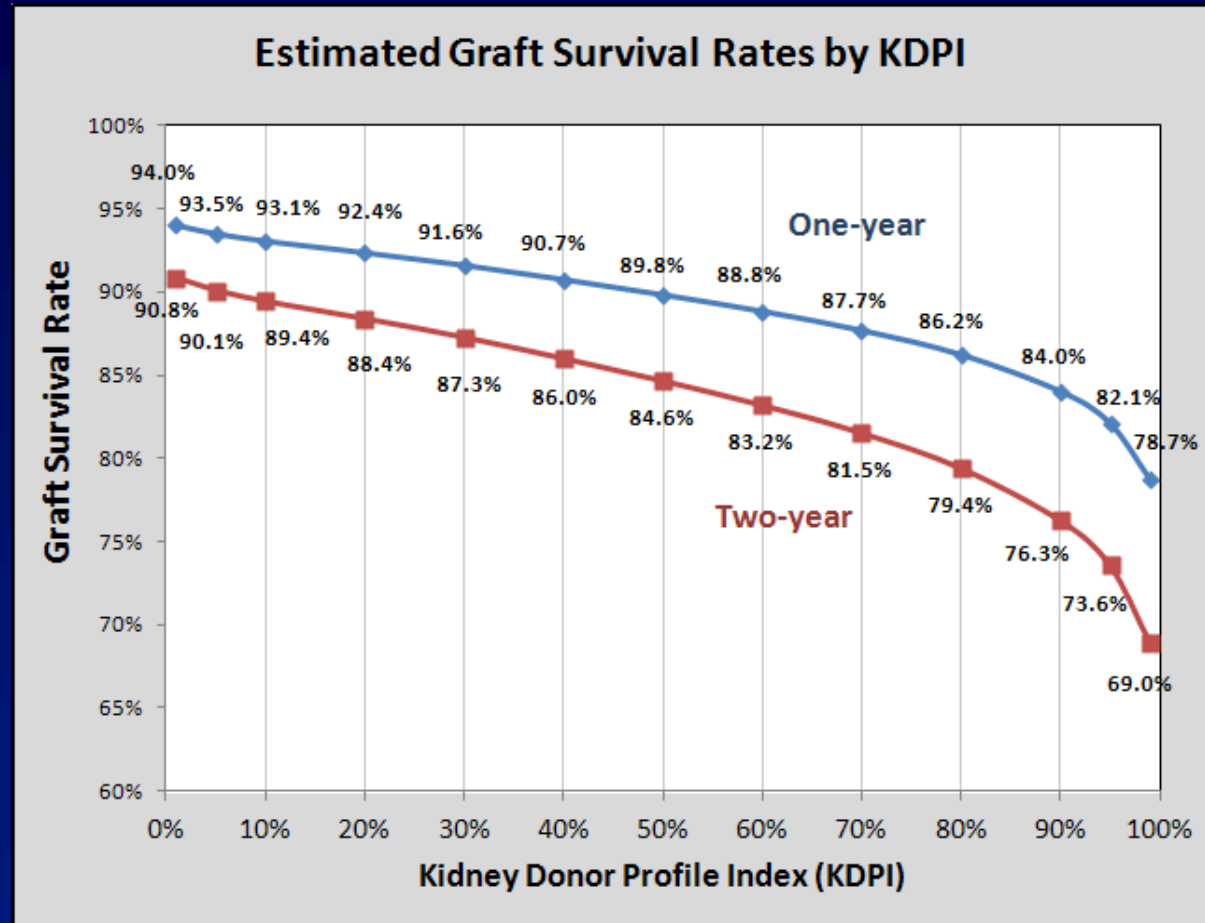
## ■ ECD

- Donor Age
  - >60 alone
- Donor Age
  - >50 with two below:
    - Cr >1.5
    - HTN
    - CVA
- RR of graft failure >1.7 compared to the 'ideal' donor age 35 (16 – 17%)

# 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



*KDPI values now displayed with  
all organ offers in DonorNet<sup>®</sup>*

**Table 2: Estimated Kidney Graft Survival Rates, by Donor KDRI**

KDPI	KDRI	Estimated Kidney Graft Survival Rates by KDRI			
		1 Year	3 Years	5 Years	8 Years
1%	0.55	94.0%	87.8%	80.5%	68.7%
5%	0.61	93.5%	86.7%	78.8%	66.2%
10%	0.65	93.1%	85.9%	77.6%	64.4%
20%	0.73	92.3%	84.4%	75.3%	61.1%
30%	0.81	91.5%	82.9%	73.0%	57.9%
40%	0.90	90.5%	81.1%	70.4%	54.4%
50%	1.00	89.5%	79.2%	67.6%	50.8%
60%	1.10	88.6%	77.4%	65.2%	47.6%
70%	1.23	87.3%	75.1%	61.9%	43.6%
80%	1.39	85.8%	72.4%	58.3%	39.2%
90%	1.62	83.7%	68.7%	53.3%	33.6%
95%	1.85	81.6%	65.2%	48.9%	28.9%
99%	2.30	77.7%	58.8%	41.1%	21.4%

Sequence A KDPI ≤20%	Sequence B KDPI >20% but <35%	Sequence C KDPI ≥35% but ≤85%	Sequence D KDPI>85%
Highly Sensitized 0-ABDRmm (top 20% EPTS) Prior living donor Local pediatrics Local top 20% EPTS 0-ABDRmm (all) Local (all) Regional pediatrics Regional (top 20%) Regional (all) National pediatrics National (top 20%) National (all)	Highly Sensitized 0-ABDRmm Prior living donor Local pediatrics Local adults Regional pediatrics Regional adults National pediatrics National adults	Highly Sensitized 0-ABDRmm Prior living donor Local Regional National	Highly Sensitized 0-ABDRmm Local + Regional National

Once in a category, candidates are rank ordered according to points

# Longevity Matching

- Estimated Post-Transplant Survival (EPTS)
  - Candidate age, time on dialysis, prior organ transplant, diabetes status
- Top 20% of candidates by EPTS to receive kidneys matched on longevity (KDPI < 20%)
  - Candidates can have an EPTS score in the top 20% even at age 50
- Applies only to kidneys with KDPI scores  $\leq 20\%$  not allocated for multi-organ, very highly sensitized, or pediatric candidates

# New Classifications: Very Highly Sensitized

- Candidates with CPRA  $\geq 98\%$  face immense biological barriers
- New classifications ahead of 0-ABDR mismatch classifications

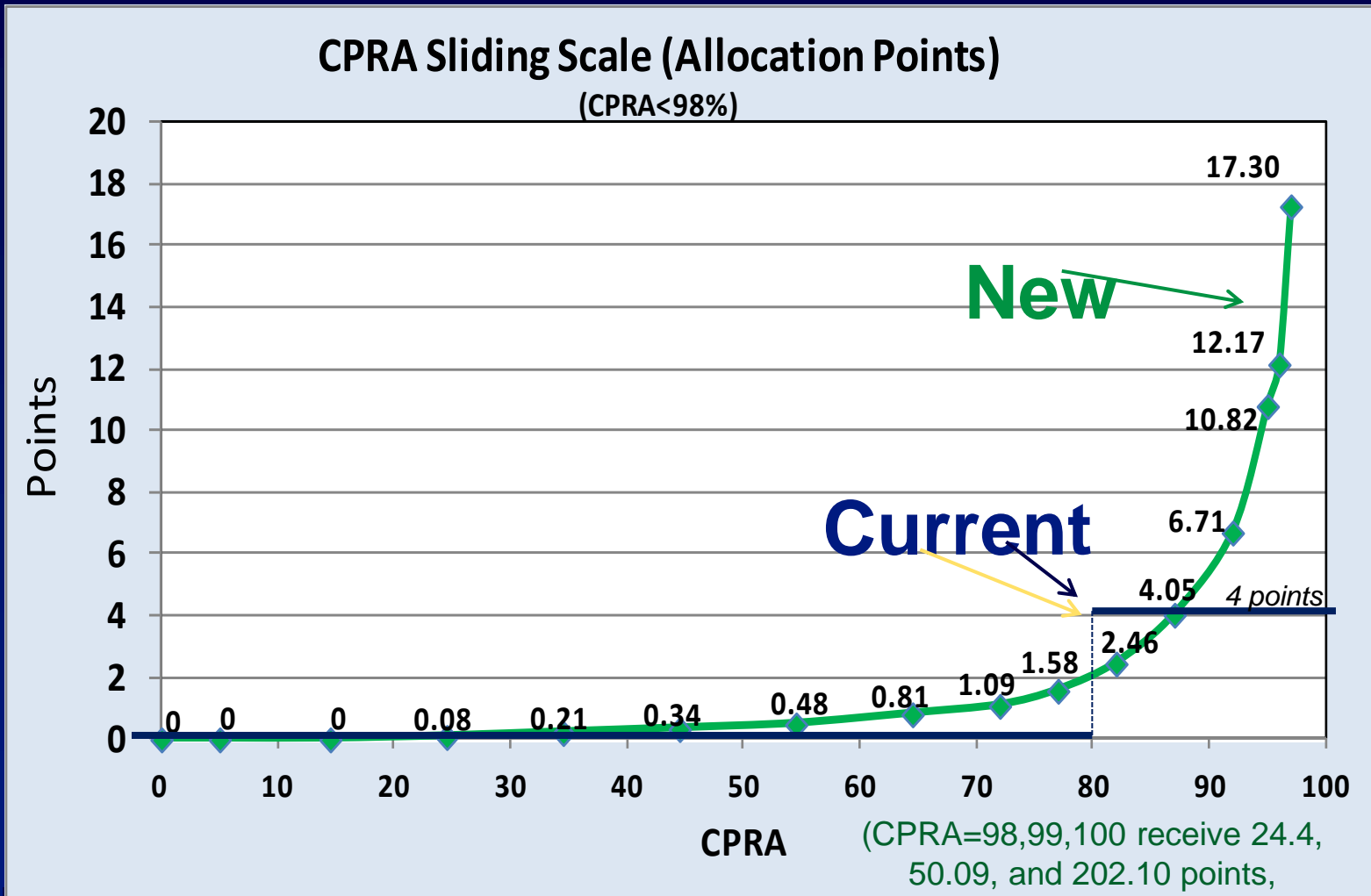
CPRA=100%	National
CPRA=99%	Regional
CPRA=98%	Local

- To participate in Regional/National sharing, review & approval of unacceptable antigens will be required

*Within each category 0-ABDR mismatches come first*



# Sliding Scale Based on CPRA



- Current policy: 4 points for CPRA ≥ 80%. No points for moderately sensitized candidates. Proposed policy: sliding scale starting at CPRA ≥ 20%

# Waiting Time Definition Expanded

- Waiting time points for dialysis time prior to registration
  - Applies to both pediatric and adult candidates
  - Better recognizes time spent with ESRD as the basis for priority
- Candidates may still be listed preemptively and accrue time with a  $GFR \leq 20 \text{ml/min}$

# B Candidates Eligible for A<sub>2</sub>/A<sub>2</sub>B Kidneys

- Candidates with blood type B who meet defined clinical criteria will be eligible to accept kidneys from donors with blood type A<sub>2</sub> or A<sub>2</sub>B
- Clinical criteria set by each transplant program
- Reporting in UNet required every 90 days (+/- 20)

# Pediatric Offers Based on KDPI

- Pediatric priority for kidneys from donors with KDPI scores <35%
- Pediatric candidates no longer offered non 0-ABDR mismatch kidneys with KDPI >85%

# Kidney Paybacks Removed

- Kidney paybacks would no longer be permitted.
- All payback credits and debts would be eliminated upon the implementation of the revised kidney allocation system.

# Local + Regional Distribution for High KDPI Kidneys

- KDPI >85% kidneys will be allocated to a combined local and regional list

# Variations Removed

- Numerous variations to existing kidney allocation system
- Necessary to eliminate variations
  - To establish a baseline from which to evaluate new variations
  - To bring new variations into alignment with OPTN Final Rule requirements
- New policy makes DSA first level of allocation for KDPI <85% kidneys
- Need a geographic metric to better assess disparity before variations can effectively address
- Variations add significant cost/time to national policy revisions

**DONOR A (Questions 2-4):**  
**A 38 y/o male (5"5, 80 kg) blood Type O ) is declared brain dead following head trauma from a skiing injury. Previously healthy with no significant medical history. Terminal creatinine is 1.3 KDPI 21% Serologies are negative for CMV, HBV, HCV,HIV.**



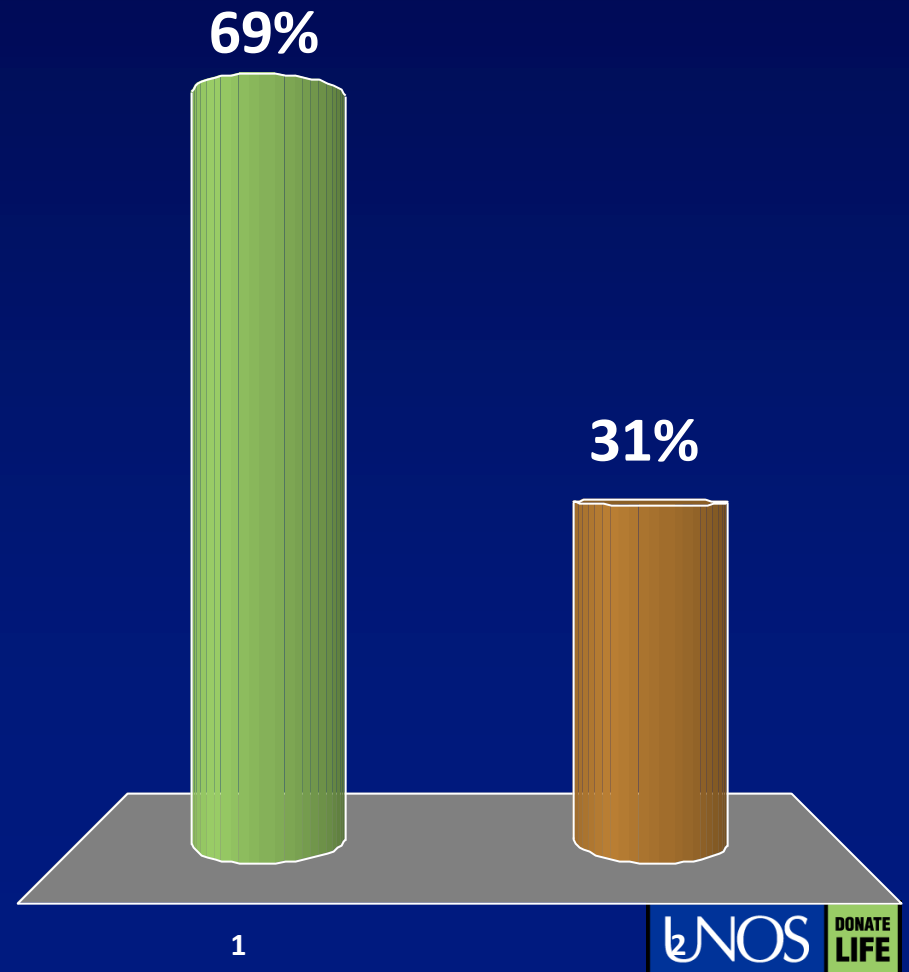
<b>Sequence A</b> KDPI ≤20%	<b>Sequence B</b> KDPI >20% but <35%	<b>Sequence C</b> KDPI ≥35% but ≤85%	<b>Sequence D</b> KDPI>85%
Highly Sensitized O-ABDRmm (top 20% EPTS) Prior living donor Local pediatrics Local top 20% EPTS O-ABDRmm (all) Local (all) Regional pediatrics Regional (top 20%) Regional (all) National pediatrics National (top 20%) National (all)	Highly Sensitized O-ABDRmm Prior living donor Local pediatrics Local adults Regional pediatrics Regional adults National pediatrics National adults	Highly Sensitized O-ABDRmm Prior living donor Local Regional National	Highly Sensitized O-ABDRmm Local + Regional National

Once in a category, candidates are rank ordered according to points

**Question 2: This 38 y/o  
deceased donor kidney (O  
mismatch) from a local donor  
is allocated to a 72 y/o  
unsensitized caucasian woman  
(blood Type O) who has just  
been listed**

# Would you accept this donor?

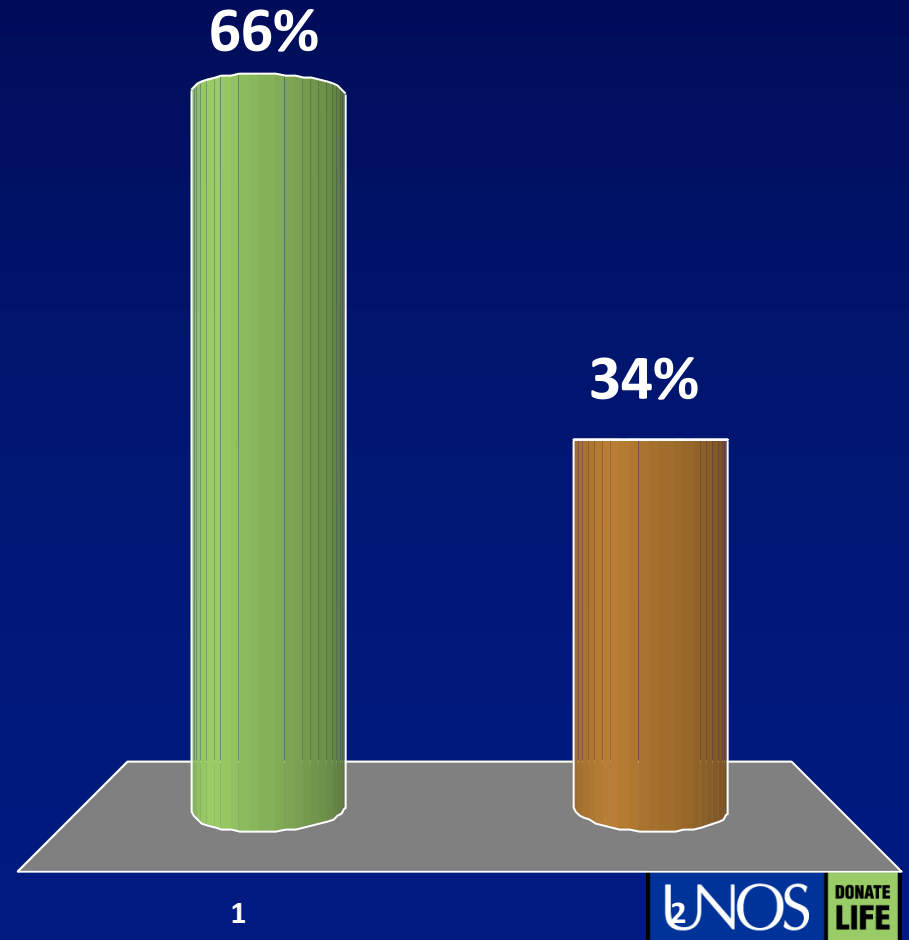
1. Yes
2. No



**Question 3: The second patient on the list is a 36 year old male with ESRD secondary to GN. Would you skip the 72 year old (ESRD from Type II diabetes) to give this 38 y/o donor kidney to the younger recipient listed at your center?**

# Yes or No?

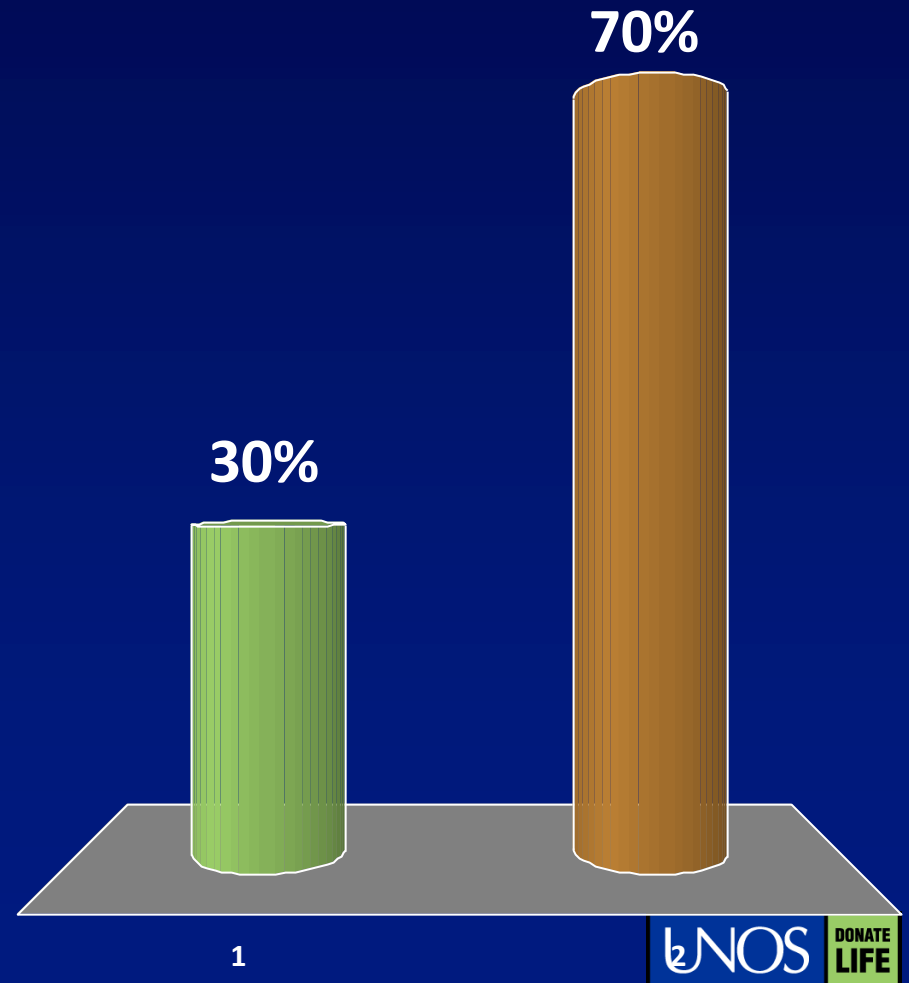
1. Yes
2. No



**Question 4: The second patient on the list is at another center in your OPO – you only know the age of the recipient is 34. Would you skip your 72 y/o pt so a younger pt can be transplanted at another local center?**

# Yes or No?

1. Yes
2. No



**DONOR B (Questions 5-6): A 56 y/o petite female smoker (5'1,50 kg , no h/o hypertension or diabetes) has an MI, is resuscitated, but becomes brain dead secondary to anoxia.**

**Terminal creatinine is 1.5.**

**KDPI 75%**

**Serologies are negative for HCV, HIV, and CMV. Donor team tells you the aorta was had severe plaque.**



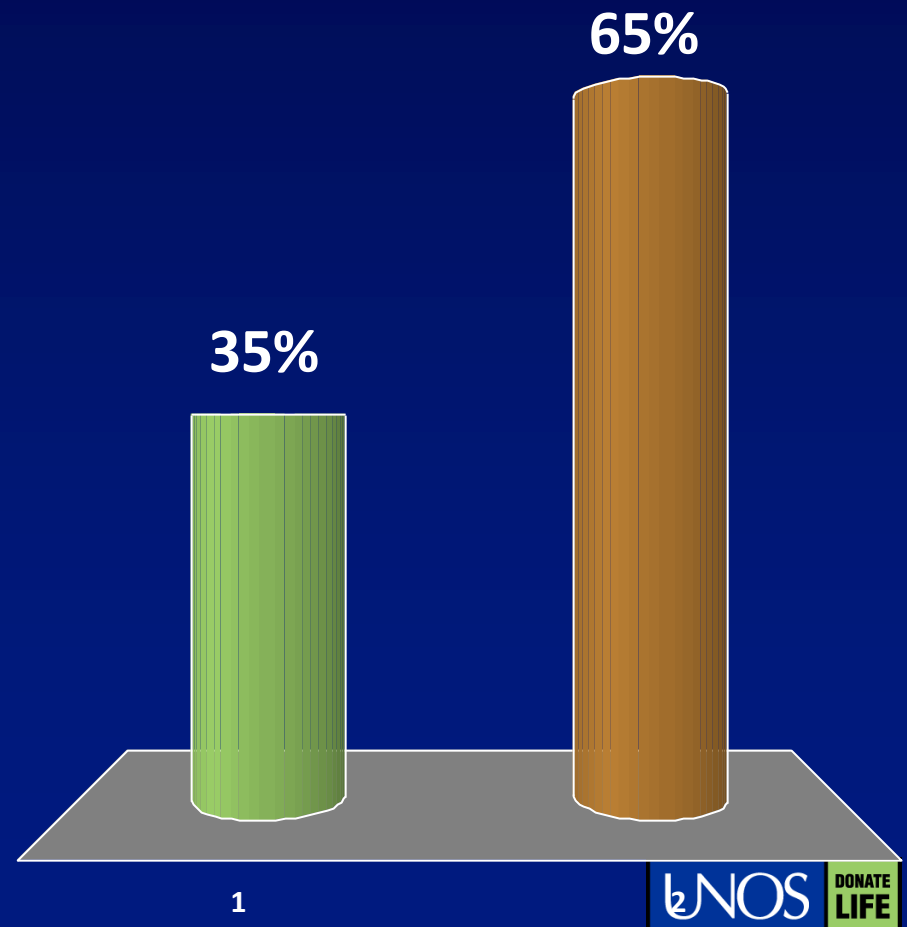
Sequence A KDPI ≤20%	Sequence B KDPI >20% but <35%	Sequence C KDPI ≥35% but ≤85%	Sequence D KDPI>85%
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Once in a category, candidates are rank ordered according to points

**Question 5: This KDPI 75% kidney is offered to a 42 y/o male (6 ft, 95 kg) with ESRD secondary to GN. He is unsensitized and has been waiting 7 years for a kidney.**

# Would you accept this donor?

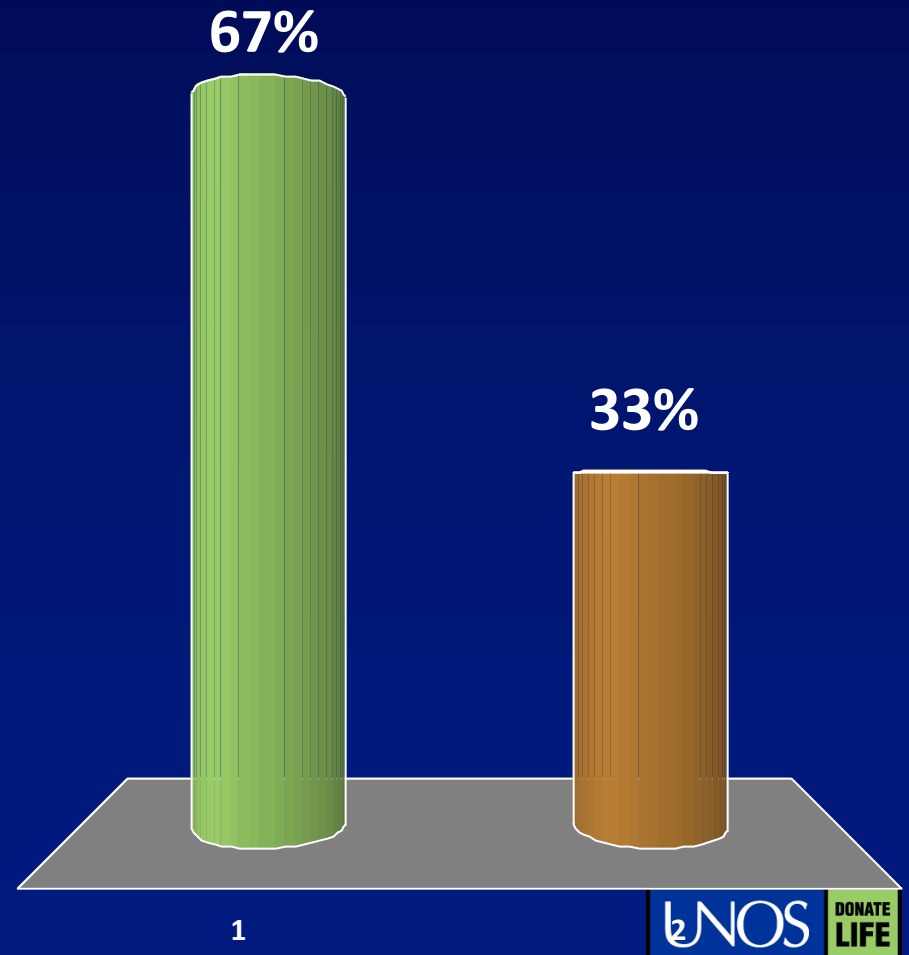
1. Yes
2. No



**Question 6: This KDPI 75% kidney is offered to a 56 y/o female (5 ft, 55kg) with ESRD secondary to hypertension. She is unsensitized and has been waiting 7 years for a kidney.**

# Would you accept this offer?

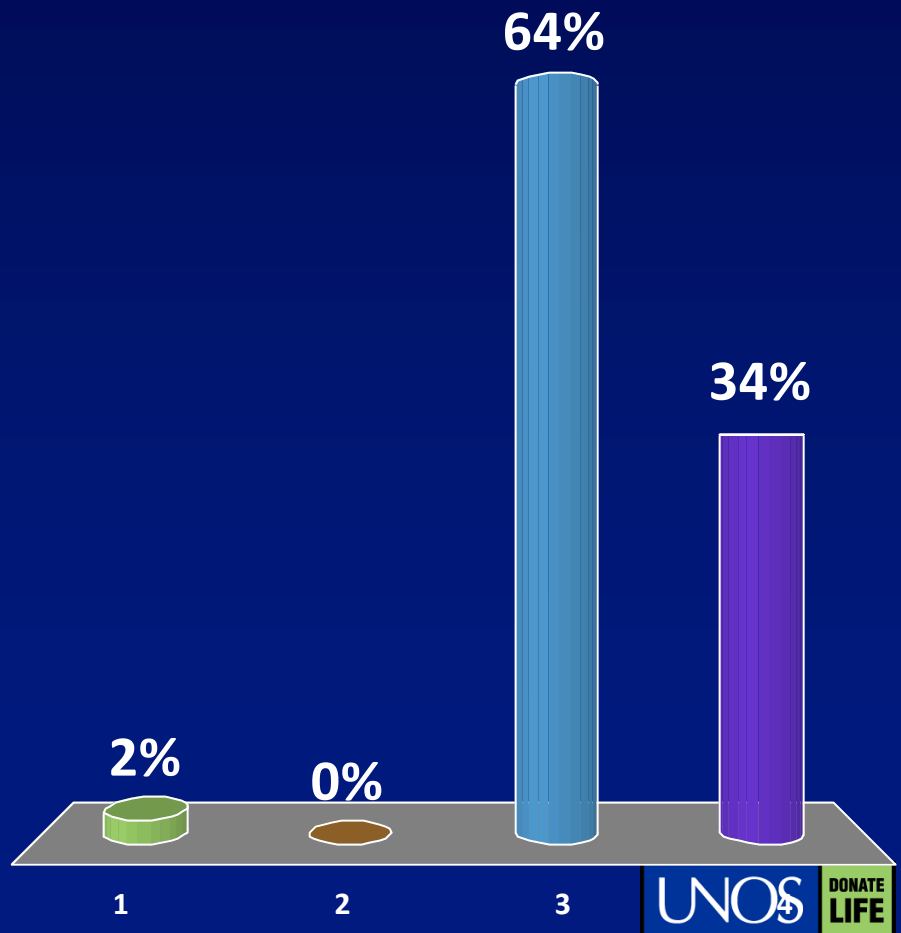
1. Yes
2. No



# IMPROMPTU QUESTION from Dr. Charlie Miller

# When you're on call at night, who are you the fiduciary of?

1. Society
2. Your institution
3. The patient
4. All of the above



**DONOR C (Question 7): Donor is classified as an ECD. She was a 69 y/o female (5'2 ft, 60 kg) with h/o hypertension who died from a CVA. Donor team tells you there is adherent fat and a markedly atherosclerotic aorta. Terminal creatinine is 1.7. KDPI 85% (ECD in new system) All serologies negative.**



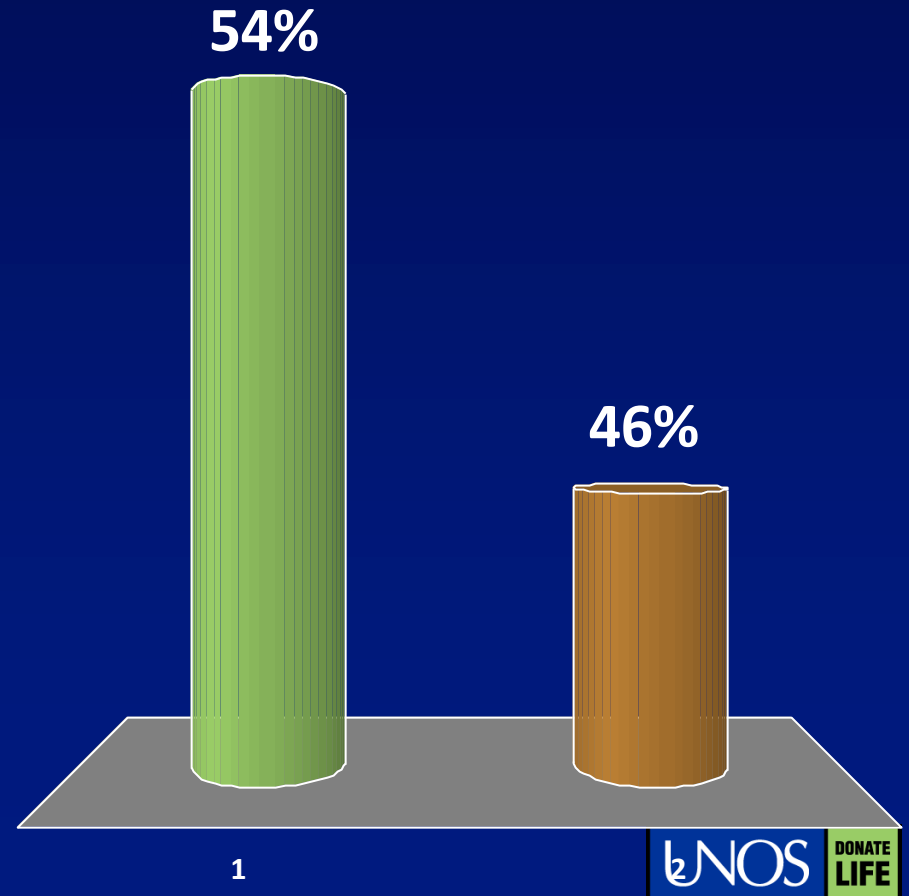
<b>Sequence A</b> KDPI ≤20%	<b>Sequence B</b> KDPI >20% but <35%	<b>Sequence C</b> KDPI ≥35% but ≤85%	<b>Sequence D</b> KDPI>85%
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Once in a category, candidates are rank ordered according to points

**Question 7: This ECD kidney is allocated to a 55 y/o diabetic male (5'11, 90 kg) who has consented to receive an ECD kidney and has been waiting three years and is now at the top of the ECD list.**

# Would you accept this offer?

1. Yes
2. No



**DONOR D (Question 8): 31 y/o male (6"1, 85 kg) professional athlete (blood Type O) with no significant medical history was declared brain dead following head trauma at an athletic event.**

**SH: multiple heterosexual partners and recent h/o of treated gonorrhea.  
Terminal creatinine is 1.1.**

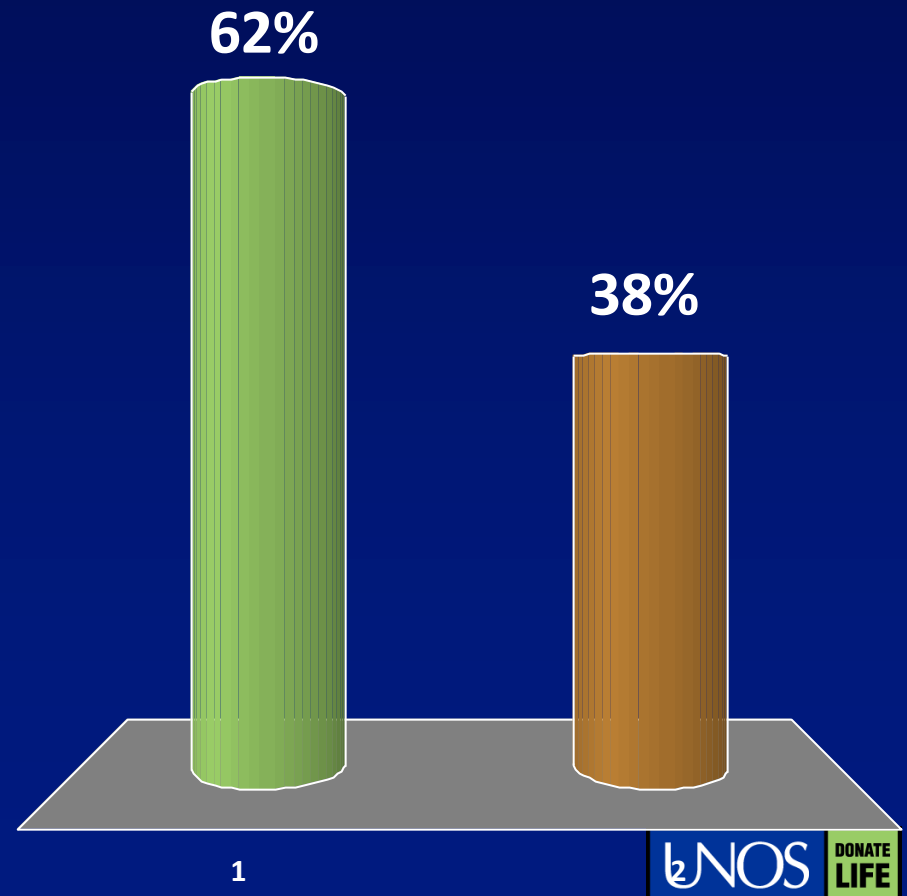
**KDPI 21%**

**NAT testing negative for HBV, HCV,  
HIV.**

**Question 8: A 42 y/o male with  
ESRD 2ary to GN (6'1, 95kg)  
has NOT consented to receive  
a CDC high risk donor.**

# Would you try to convince your recipient to accept this offer?

1. Yes
2. No



**DONOR E (Questions 9 and 10): 23 y/o male (6"0, 75 kg) with a h/o active IV drug abuse becomes brain dead following an anoxic event associated with an overdose. Donor is hemodynamically stable with a creatinine 0.9.**

**NAT testing POSITIVE for HCV.**

**NAT testing NEGATIVE for HIV, HBV.**

**Question 9: Kidney is offered to a 50 y/o male with ESRD secondary to hypertension. He is HCV positive and has consented to receive a CDC high risk donor and an HCV positive donor.**

**Would you accept this donor?**

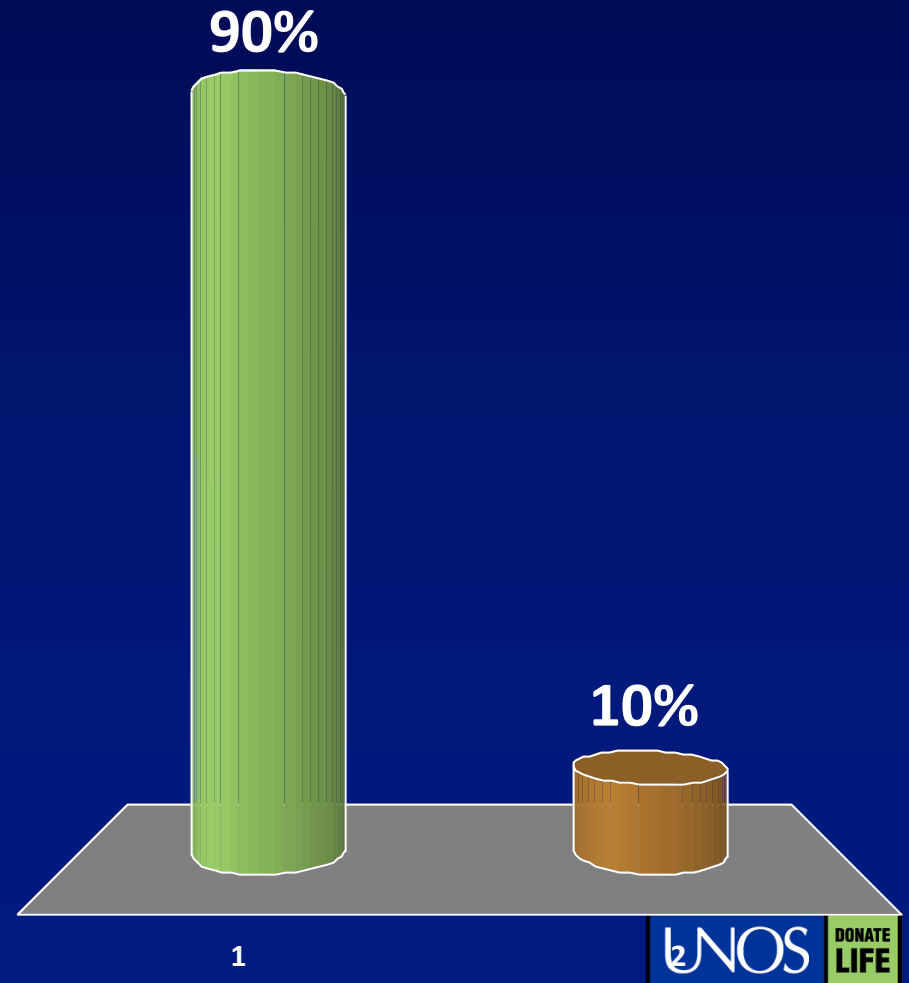
**A) YES**

**B) NO**



# Would you accept this donor?

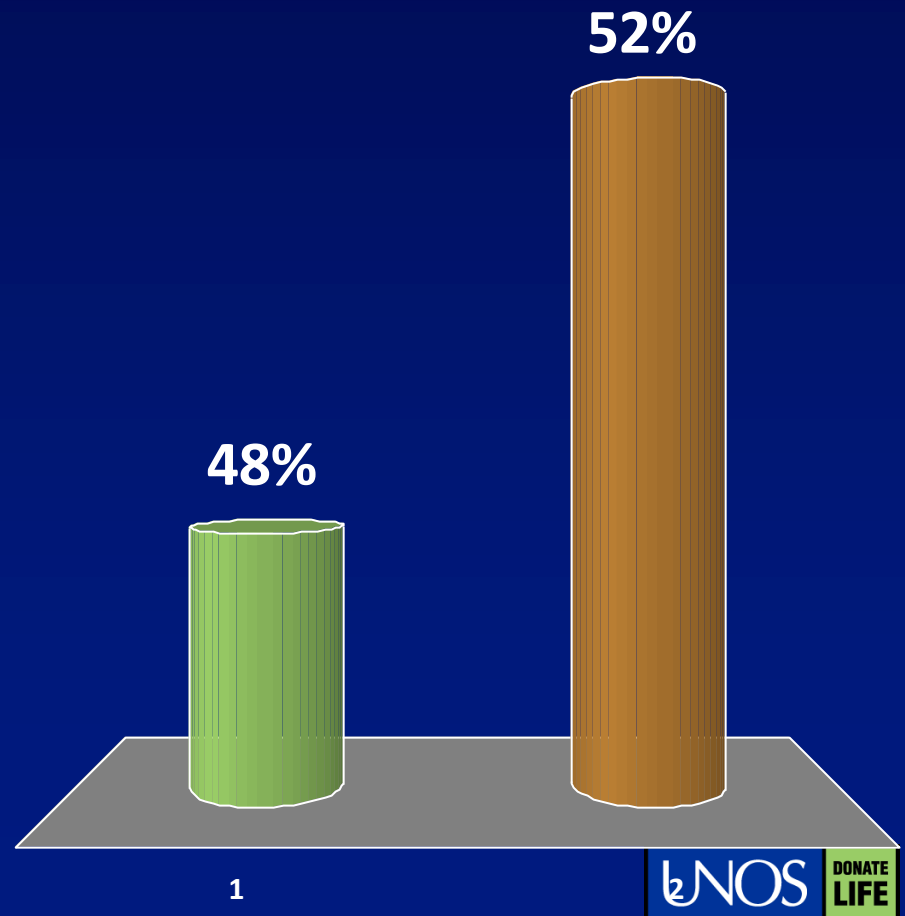
1. Yes
2. No



**Question 10: When reviewing this patient's chart, you see that he is HCV genotype II.**

# Would you accept this HCV positive donor?

1. Yes
2. No



# Conclusions

- Need to do what is best for the patient who gets the kidney offer (i.e. 72 year old offered the 21 year old donor)
- UNOS Kidney Committee will initiate new allocation algorithm to prevent major donor/recipient age mismatches
- Not all SCD kidneys are created equally – and you need to pay attention to the quality of kidney being offered to a person who has waited a long time !

# Conclusions

- New allocation system being developed which uses a donor risk index (donor profile index) which is a continuum
- But even in the new system--need to make sure that an ECD is appropriate for your recipient---unfortunately not all ECDs are created equally. Need to know what risk your recipient is willing to take to get an expedited transplant

# Conclusions

- Utilization of the CDC high risk donor can be a valuable source of high quality kidneys – but be aware of the CDC high risk label
- Bottom line – Need to know BEFORE the time of an offer what type of donor a recipient is willing to accept
  - CDC high risk (how high a risk?)
  - ECD or SCD, but ultimately Donor Profile Index

OPTN

