



ΕΛΛΗΝΙΚΗ
ΕΤΑΙΡΕΙΑ
ΜΕΤΑΜΟΣΧΕΥΣΕΩΝ

21^ο

Πανελλήνιο
Συνέδριο
Μεταμοσχεύσεων

2-4
Δεκεμβρίου 2021

Μέγαρο Μουσικής Αθηνών

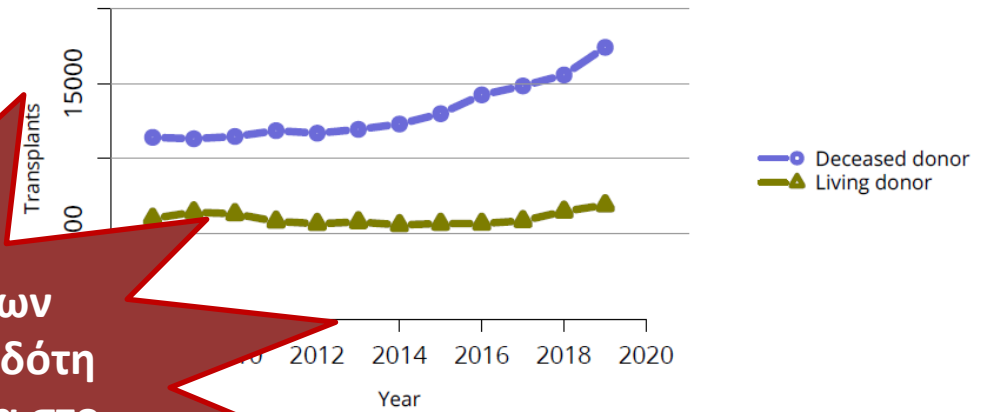
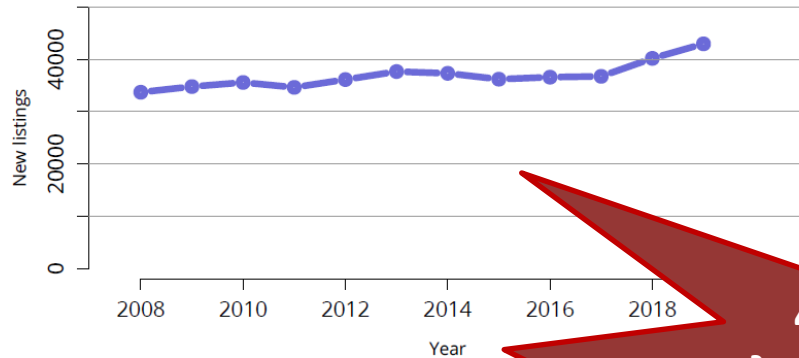


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Ζώντες δότες – ειδικές ομάδες

Ευαγγελία Ντουνούση,
Επίκουρη Καθηγήτρια Νεφρολογίας με έμφαση στις μεταμοσχεύσεις,
Πανεπιστημίου Ιωαννίνων

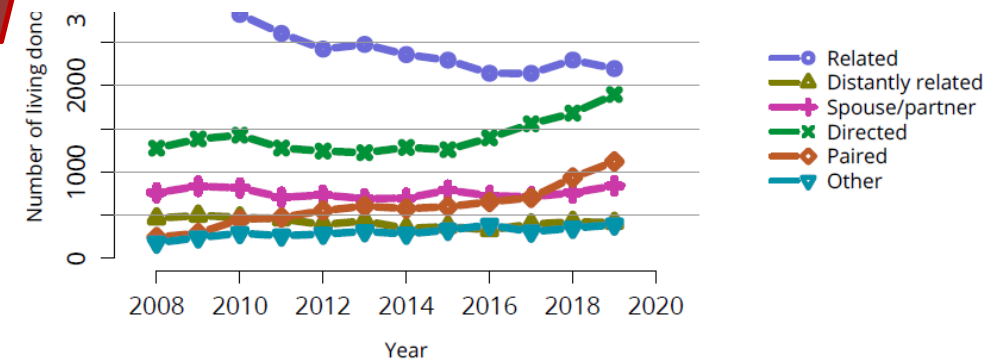
Current status of Living Kidney Donation – OPTN/SRTR Annual Data Report 2019



**40% των υποψήφιων
ληπτών χωρίς ζώντα δότη
περιμένουν > 5χρόνια στο
μητρώο αναμονής**

Figure KI 1. New adult candidates added to the kidney list. A new candidate is one who first joined the list without having been listed in a previous year. Previous recipients who underwent transplant and subsequently relisted are considered new candidates. Candidates who are deceased and inactive patients are included. Candidates listed at more than one center are counted once per listing. Includes kidney and kidney-pancreas listings.

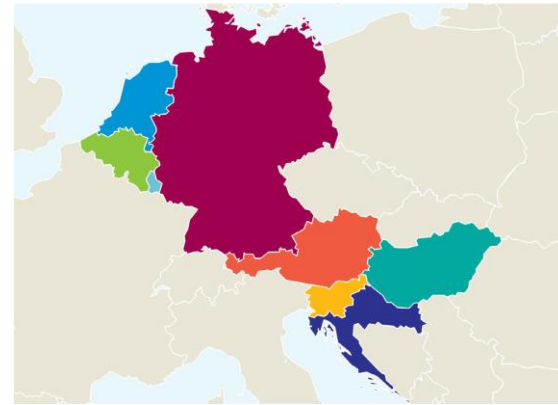
Figure KI 65. Number of living kidney transplants by donor relation. All kidney transplant recipients, including adult and pediatric, retransplant, and multi-organ recipients.



- 40% ζώντες – 60% αποβιώσαντες δότες
- Σταδιακή αύξηση των ΤΧ από αποβιώσαντες, σταθερός ο αριθμός των ΤΧ από ζώντες δότες
- Μείωση των συγγενικών ΤΧ και αύξηση των κατευθυνόμενων-μη συγγενικών ζώντων ΤΧ

Eurotransplant: donation, allocation, transplantation and waiting lists

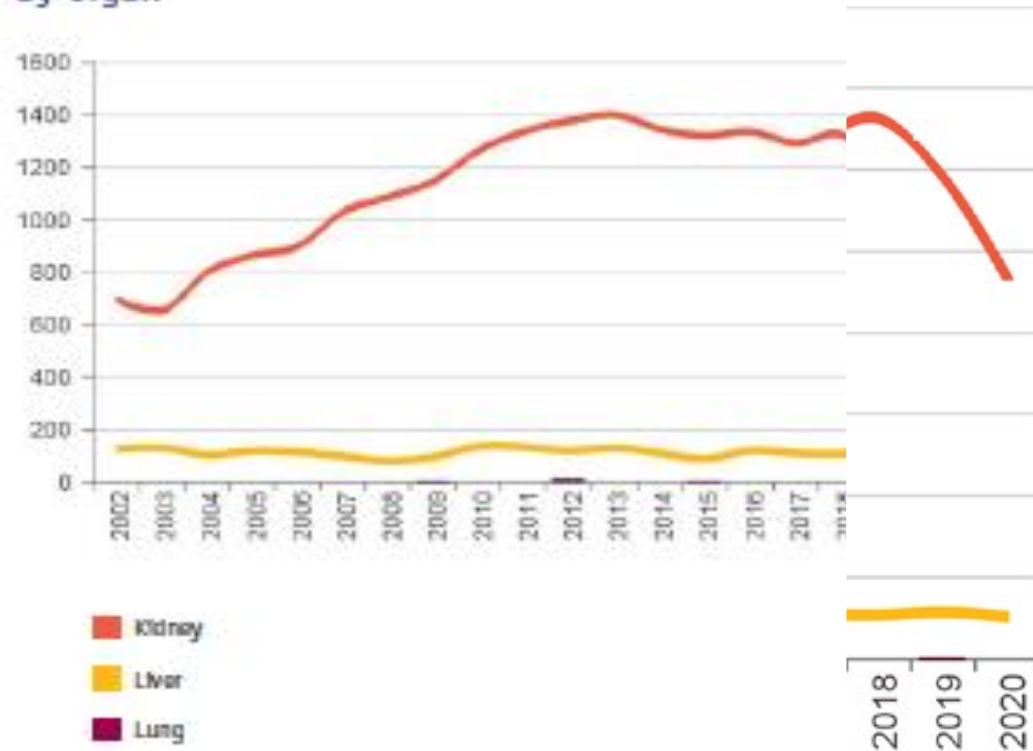
Eurotransplant Member States



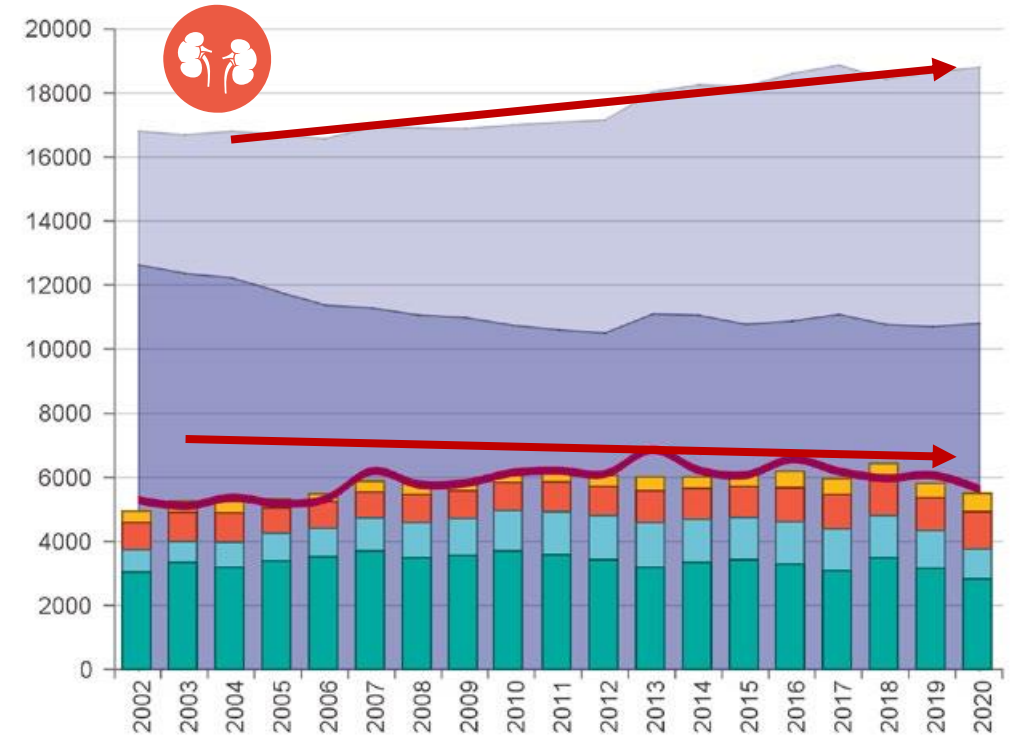
- A - Austria
- D - Germany
- HR - Croatia
- NL - Netherlands
- B - Belgium
- H - Hungary
- L - Luxembourg
- SLO - Slovenia

Annual Report 2020

2.8.4 Transplants (living donor) in Eurotransplant, by organ



2.12.1 Kidney waiting list dynamics in Eurotransplant



Μεταμοσχεύσεις Νεφρού στην Ελλάδα 2001-2021 - ΕΟΜ

Δότες Οργάνων

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Αναφερθέντες Εγκεφαλικοί Θάνατοι		76	81	81	81	81	81	81	110	57	109	204	146	106	83	120	133	109	135	75	59
Αξιοποιηθέντες ως Δότες									71	45	79	77	62	50	39	51	67	45	61	48	34
Δείκτης Δωρεάς Οργάνων (Δότες ανά εκατομμύριο πληθυσμού)	3,6					2,2	5,7	9	6,5	4,1	7,2	7,0	5,6	4,5	3,5	4,6	6,1	4,1	5,5	4,4	3,1

Μέσος χρόνος αναμονής στο μητρώο 8,8 χρόνια

Μεταμοσχεύσεις Συμπαγών Οργάνων

Από πτωματικό δότη	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Νεφρού	74	107	134	116	167	144	101	186	116	76	139	130	107	90	63	75	108	72	110	86	52
ΣΥΝΟΛΟ	74	107	134	116	167	144	101	186	116	76	139	130	107	90	63	75	108	72	110	86	
Από ζώντα δότη Νεφρού	87	85	79	76	69	63	87	52	34	32	46	41	44	42	35	49	68	69	68	89	66
ΓΕΝΙΚΟ ΣΥΝΟΛΟ	161	192	213	192	236	207	188	238	150	108	185	171	151	132	98	124	212	141	178	175	

Μεταμόσχευση από ζώντα δότη

Με στόχο την αύξηση του αριθμού των μεταμοσχεύσεων και την κάλυψη των αυξημένων αναγκών για νεφρικά μοσχεύματα...

Η δωρεά από Ζώντα Δότη πρέπει να καταστεί ακρογωνιαίος λίθος του προγράμματος δωρεάς και μεταμόσχευσης...

Με Προϋπόθεση για το δότη

Ελάχιστος κίνδυνος άμεσος και μακροπρόθεσμος για τη νεφρική λειτουργία και την υγεία του

Γιατί ...Τα Πλεονεκτήματα Ζώσας

Preemptive μεταμόσχευση

Καλύτερη επιβίωση ασθενή και μοσχεύματος

Μικρότερος χρόνος παραμονής στην ΑΜΚ

Κατάλληλος προμεταμοσχευτικός έλεγχος δότη και λήπτη

Προγραμματισμένη ΧΚ επέμβαση

Μικρότερο κόστος

National data

- Σχεδόν **1/3** πιθανοί ζώντες δότες νεφρικού μοσχεύματος **απορρίπτονται λόγω ΑΣΥΜΒΑΤΟΤΗΤΑΣ** με το λήπτη.

Η ασυμβατότητα αφορά είτε σε ABO είτε σε HLA ασυμβατότητα.

- **2 κύριες στρατηγικές να ξεπεραστεί αυτό το εμπόδιο:** νομιμοποίηση προγραμμάτων μεταμοσχεύσεων ανταλλαγής μοσχευμάτων (χιαστή, αλυσίδα μεταμοσχεύσεων κ.ά) ή απευαισθητοποίηση του δότη

1^η επιτυχημένη ζώσα μεταμόσχευση 1954 έως το 1980...

Μοναδικός τύπος ζώσας μεταμόσχευσης

Κατευθυνόμενη – άμεση δωρεά

Σε συγγενή εξ αίματος - γενετική-συναισθηματική
σύνδεση δότη-λήπτη

“the only remaining problem was the ethical decision concerning the removal of a healthy organ from a normal person for the benefit of someone else”

Joseph Murray, Nobel Lecture, December 1990



Από το 1980 και μετά

Ταξινόμηση τύπων δωρεάς από ζώντα δότη

Α. Κατευθυνόμενη – άμεση δωρεά


(α) σε συγγενή εξ αίματος (γενετική-συναισθηματική σύνδεση δότη-λήπτη)

(β) σε συναισθηματικά αλλά όχι γενετικά συνδεδεμένο λήπτη (σύζυγο, σύντροφο, στενό φίλο)

(γ) σε γενετικά και συναισθηματικά μη συνδεδεμένο λήπτη - άμεση αλτρουιστική δωρεά

Ε

Διεύρυνσης της «δεξαμενής» των ζώντων δοτών
Καλής ποιότητας μοσχεύματα - υγιείς δότες/ Εξασφάλιση συμβατότητας (ABO-HLA)



Γ. Μη κατευθυνόμενη δωρεά - ανώνυμη δωρεά

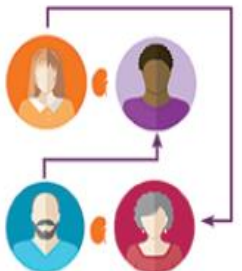
(α) σε λήπτη στο μητρώο αναμονής από αποβιώσαντα δότη

(β) σε πρόγραμμα ανταλλαγής μοσχευμάτων μεταξύ ζευγαριών με τη διαδικασία domino

#2 Non-Directed Donation:



#3 Paired Donations (Kidney Only):





Η Αφαίρεση οργάνων από ζώντα δότη επιτρέπεται μόνον όταν πρόκειται να γίνει μεταμόσχευση:

ΕΦΗΜΕΡΙΣ ΤΗΣ ΚΥΒΕΡΝΗΣΕΩΣ ΤΗΣ ΕΛΛΗΝΙΚΗΣ ΔΗΜΟΚΡΑΤΙΑΣ

ΤΕΥΧΟΣ ΠΡΩΤΟ

Αρ. Φύλλου 150

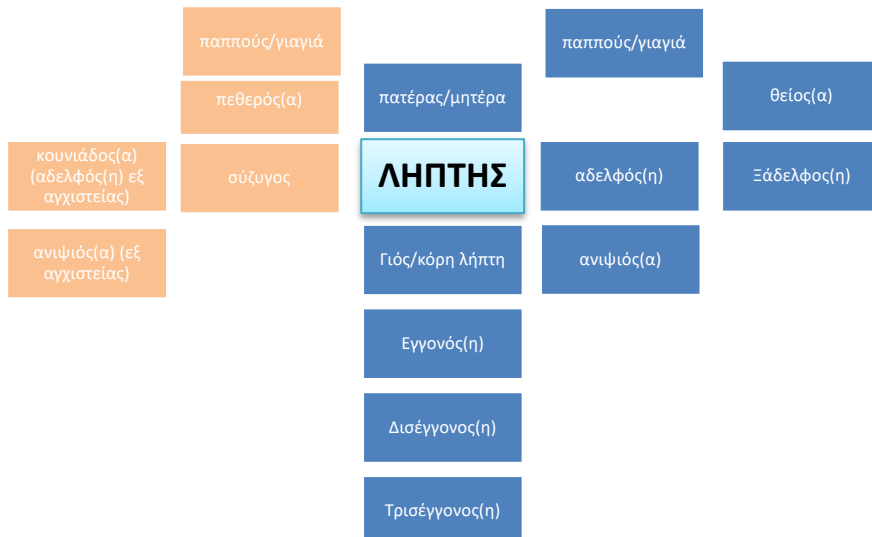
27 Ιουνίου 2011

ΝΟΜΟΣ ΥΠ' ΑΡΙΘΜ. 3984

Δωρεά και μεταμόσχευση οργάνων και άλλες διατάξεις

Εξ αγχιστείας

Εξ αίματος

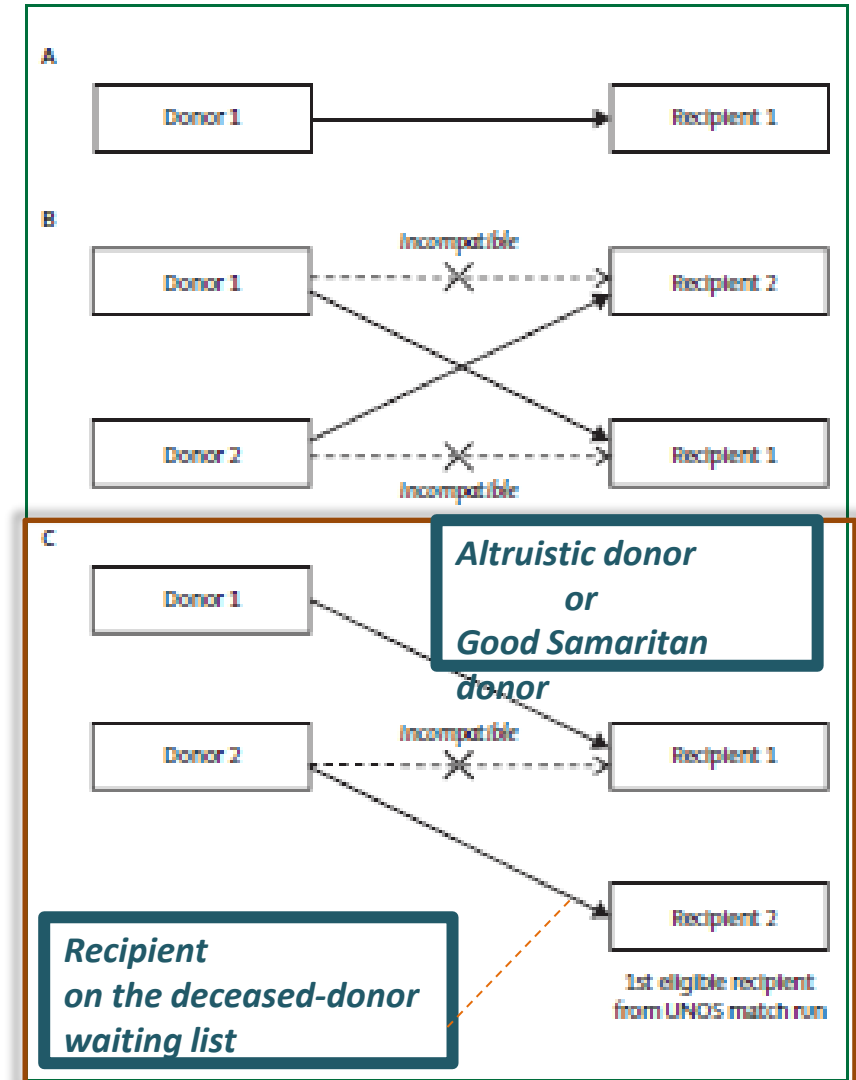
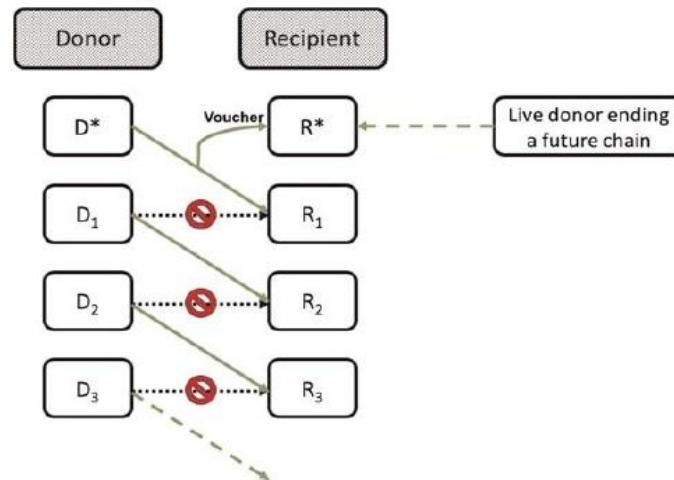
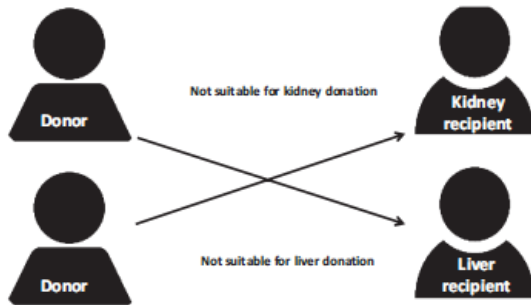


- α) στον σύζυγο του,
- β) σε ασθενή με τον οποίο ο δότης συνδέεται με σύμφωνο ελεύθερης συμβίωσης (ν. 3719/2008), άνω των τριών χρόνων,
- γ) σε συγγενή μέχρι και τον 4ο βαθμό εξ αίματος, σε ευθεία ή πλάγια γραμμή,
- δ) σε συγγενή μέχρι το 2ο βαθμό εξ αγχιστείας,
- ε) σε πρόσωπο με το οποίο έχει προσωπική σχέση και συνδέεται συναισθηματικά (άδεια από τον Ε.Ο.Μ. & σύμφωνη γνώμη μη αμειβόμενης Επιτροπής)
- ζ) εάν δεν υπάρχει ιστοσυμβατότητα μεταξύ 2 υποψήφιων ληπτών μοσχεύματος και του ζώντα συζύγου τους ή συγγενή τους με βαθμό συγγένειας ως άνω, αλλά υπάρχει ιστοσυμβατότητα μεταξύ του ενός υποψήφιου λήπτη και του ζώντα συζύγου ή συγγενή του άλλου, επιτρέπεται η δωρεά οργάνων αμοιβαία, (απόφαση ΕΟΜ)
- η) Οι περ. (στ) και (ζ) εφαρμόζονται και στις περιπτώσεις των υποψηφίων δοτών της περ. (ε) (συναισθηματικοί δότες), εφόσον η έλλειψη συμβατότητας διαπιστώνεται μετά από τη χορήγηση της άδειας του ΕΟΜ της παρ. 1.

στ) αν ο σύζυγος ή συγγενής με τον ανωτέρω βαθμό συγγένειας, ασθενούς, που χρήζει μεταμόσχευσης, επιθυμούν να κάνουν δωρεά του αναγκαίου οργάνου, αλλά δεν υπάρχει ιστοσυμβατότητα, πραγματοποιείται η αφαίρεση του οργάνου και ταυτόχρονα ο ασθενής προτάσσεται στην κατάταξη στο Εθνικό Μητρώο,

TYPES OF KIDNEY PAIRED DONATION

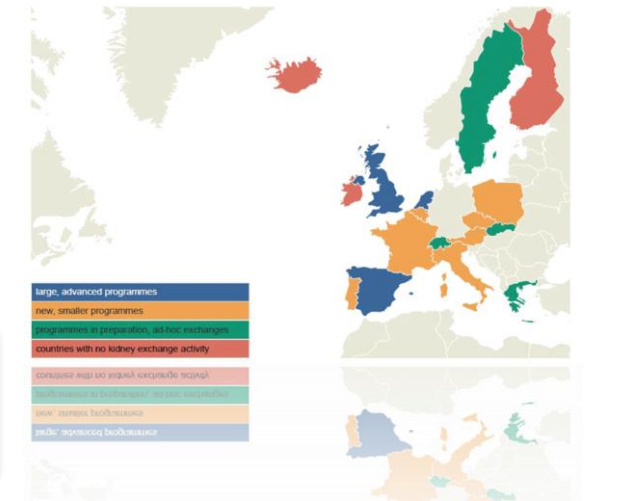
- Two-pair exchange
- Domino kidney paired donation
- **Bridge donors forming chains of transplantation**
(Nonsimultaneous, Extended, Altruistic-Donor Chain, *NEAD chain*)
- **Advanced donation and "voucher" for future kidney TX**
- **Living-donor kidney shipping**
- **Compatible pairs** (in the KPD creates additional TX opportunities for incompatible pairs)
- **Quasi-compatible pairs**
- **Trans organ paired exchange**



National and multicenter KPD programs with nationwide reach

Program	Country	Remarks
Dutch PKE program [11,59–62]	The Netherlands	<ul style="list-style-type: none"> Started in 2004 by 8 transplant centers in collaboration with the Dutch Transplant Foundation Donors travel to the recipient's center Has a central histocompatibility laboratory From 2004 till 2014 – 685 pairs registered – 529 (77%) transplanted 90 patients transplanted through the domino paired donation
UK living kidney sharing scheme [14,15,63]	UK	<ul style="list-style-type: none"> Started in 2007 The largest European PKE program 1000th PKE done in 2019 Accepts ABOi matches in exchange
Spanish PKE program [15,64]	Spain	<ul style="list-style-type: none"> First exchange performed in 2009 Till 2016 performed 142 PKE Accepts ABOi matches in exchange
Canadian kidney paired donation program [12,65]	Canada	<ul style="list-style-type: none"> Started in 2009 Total 742 transplants done till 1st of 2019 Donors travel to the recipient's center
Australian and New Zealand paired kidney exchange (ANZKX) [42,66]	Australia and New Zealand	<ul style="list-style-type: none"> Started as PKE program in 2010 in Australia. Later joined by New Zealand First exchange in 2011
National kidney registry [16,21,22]	USA	<ul style="list-style-type: none"> First exchange in KEP: 20XX Altruistic donor chains possible? Compatible pairs/ couples participate? Multiple donors register for one patient? Incompatible transplants allowed within KEP? Single lab carries out crossmatching after virtual matching? Simultaneous surgery required for an exchange in KEP? Organs usually travel (O) or donors (D)? Matching process every x months (NR = not regular)
Alliance for paired kidney donation [35,52,67,68]	USA	<ul style="list-style-type: none"> Longest exchange already conducted Longest chain already conducted
UNOS [10]	USA	<ul style="list-style-type: none"> Around 35% matching rate

European Network for Collaboration on Kidney Exchange Programmes (ENCKEP)

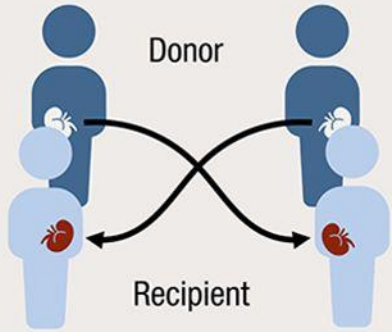







	Austria	Belgium	Czech Republic	France	Italy	Netherlands	Poland	Portugal	Spain	UK	Sweden	Switzerland
Number of exchanges	13	14	11	14	07	04	15	13	09	07		
Altruistic donor chains possible?	✓	x	✓	x	✓	✓	x	✓	✓	✓	x	x
Compatible pairs/ couples participate?	x	x	✓	x	✓	✓	✓	x	✓	✓	✓	✓
Multiple donors register for one patient?	✓	x	✓	x	✓	x	✓	✓	✓	✓	✓	✓
Incompatible transplants allowed within KEP?	✓	x	✓	x	x	x	x	x	✓	✓	✓	✓
Single lab carries out crossmatching after virtual matching?	✓	✓	✓	x	x	✓	x	x	x	x	x	x
Simultaneous surgery required for an exchange in KEP?	✓	✓	x	✓	✓	✓	x	✓	✓	✓	✓	✓
Organs usually travel (O) or donors (D)?	D	O	-	O	O	D	O	O	O	O	O	D
Matching process every x months (NR = not regular)	NR	NR	3	3	NR	3	1	3	4	3	na	3
Longest exchange already conducted	3	3	7	2	2	4	3	3	3	3	na	na
Longest chain already conducted	na	na	6	na	6	3	na	na	6	3	na	na

In 2019, there were 1118 KPD TX in the US, approximately 16% of all LKD

Paired kidney donation compared to living kidney donation: What is the long-term data?

CJASN
Clinical Journal of American Society of Nephrology

National Kidney Registry facilitates kidney paired donation		paired donation recipients are more likely to be...		5-year Graft failure	7-year Graft failure	5-year Mortality	7-year Mortality
	black		National Kidney Registry N = 2363	6.4%	8.7%	6.8%	10.9%
	female		Control living donor N = 54,497	7.2%	10.5%	7.0%	11.2%
	hyper-immunized		Control unrelated living donor N = 25,900	7.3%	10.7%	7.1%	11.6%
	second transplant		Control paired donation N = 4635	8.0%	11.5%	7.8%	12.6%
	public insurance						

- ✓ 2363 consecutive KPD transplants
- ✓ between 2008 and 2017
- ✓ through the National Kidney Registry, a voluntary KPD network
- ✓ Adjustment for a number of recipient, donor and transplant factors

Conclusions Even after transplanting patients with greater risk factors for worse post-transplant outcomes, nationalized paired donation results in equivalent outcomes.

David B. Leeser MD, Alvin G. Thomas, Ashton A. Shaffer, et al. *Patient and Graft Survival after 10 Years of National Kidney Paired Donation*. CJASN doi: 10.2215/CJN.06660619. Visual Abstract by Joel Topf, MD, FACP

David B. Leeser et al. CJASN 2020;15:228-237

CJASN
Clinical Journal of the American Society of Nephrology

Association Between Donor-Recipient Biological Relationship and Allograft Outcomes After Living Donor Kidney Transplant

S. Ali Husain, MD, MPH; Kristen L. King, MPH; Navin Sanichar, BA; R. John Crew, MD; Jesse D. Schold, PhD, MStat, MEd; Sumit Mohan, MD, MPH

- ✓ 72 980 transplant donor and recipients included in the study / OPTN 1/2000 – 12/2004
 - ✓ 43174 (59%) donors and recipients were biologically related
 - ✓ 29806 (41%) were **UNRELATED**

Primary outcome: death censored allograft failure



Although both groups of allografts displayed similar unadjusted death-censored survival, allografts from living UNRELATED transplants had LONGER SURVIVAL AFTER HLA MATCHING

(HR, 1.05; 95%CI, 1.01-1.10; P = .03)

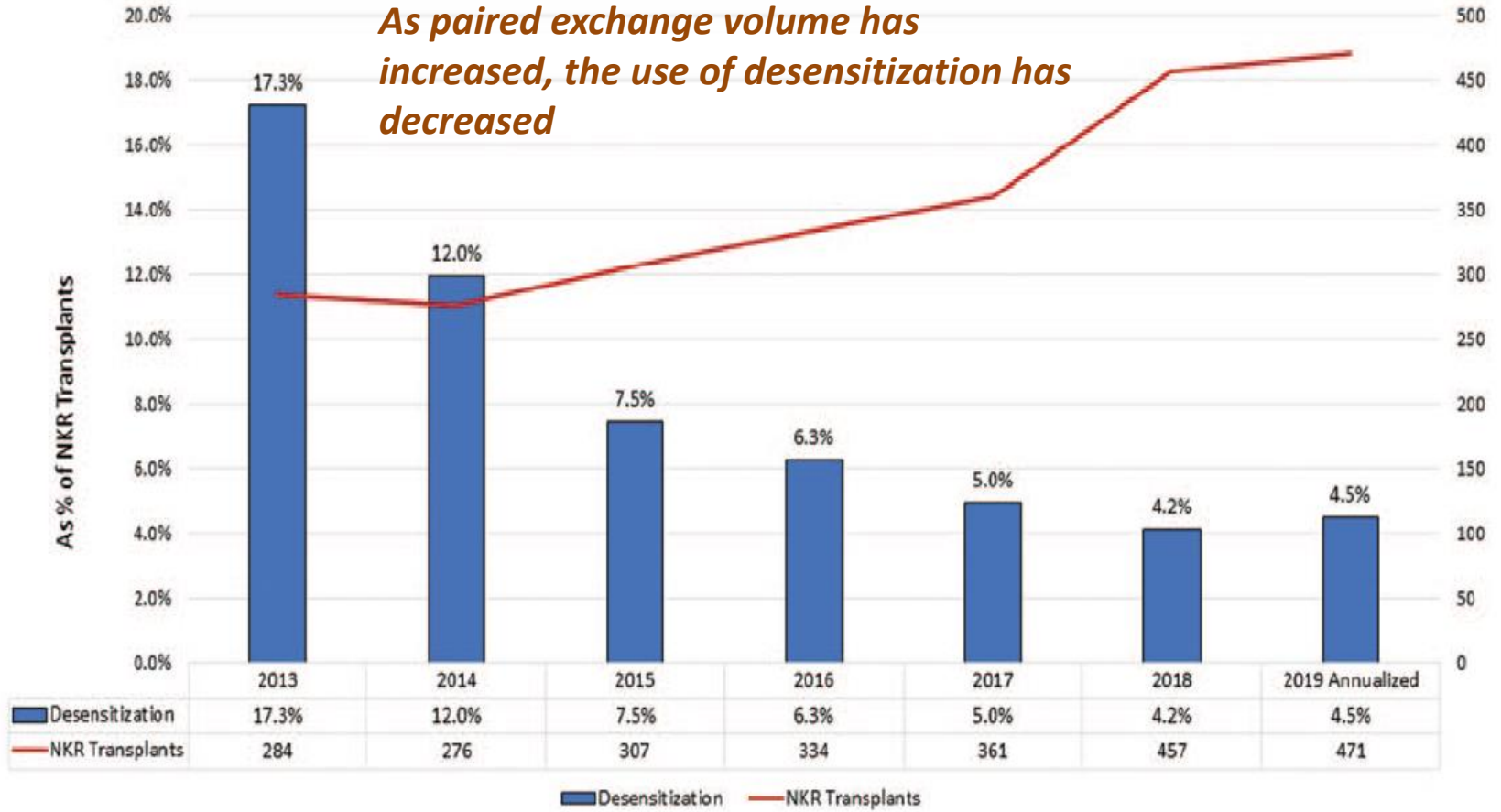
Association Between Donor-Recipient Biological Relationship and Outcomes After Living Donor Kidney Transplant

	Unadjusted		Model 1		Model 2		Model 3	
	HR (95% CI)	P value	HR (95% CI)	P value	HR (95% CI)	P value	HR (95% CI)	P value
Death-censored graft failure								
Donor related to recipient, full cohort	1.01 (0.97-1.04)	.77	1.26 (1.21-1.31)	<.001	1.06 (1.02-1.11)	.005	1.05 (1.01-1.10)	.03
Donor related to recipient, cystic kidney disease ^b	0.91 (0.78-1.07)	.26	1.08 (0.90-1.30)	.40	1.04 (0.86-1.25)	.68	1.03 (0.85-1.24)	.77
Donor related to recipient, noncystic kidney disease ^c	0.95 (0.91-0.98)	.004	1.2 (1.15-1.25)	<.001	1.07 (1.02-1.11)	.005	1.05 (1.01-1.10)	.03
							1.12 (1.01-1.23)	.03
							1.03 (0.98-1.08)	.20
							1.12 (1.08-1.15)	<.001
							1.06 (0.92-1.21)	.43
cystic kidney disease^b								
Donor related to recipient, non-cystic kidney disease ^c	0.96 (0.93-0.99)	.002	1.11 (1.07-1.14)	<.001	1.13 (1.10-1.17)	<.001	1.12 (1.08-1.16)	<.001
Donor related to recipient, donor African American ^d	1.05 (0.98-1.13)	.17	1.17 (1.07-1.27)	<.001	1.13 (1.03-1.22)	.006	1.11 (1.02-1.21)	.02
Donor related to recipient, donor not African American ^e	0.98 (0.95-1.00)	.09	1.11 (1.07-1.15)	<.001	1.11 (1.07-1.15)	<.001	1.10 (1.06-1.14)	<.001
Recipient death								
Donor related to recipient, full cohort	1.00 (0.96-1.03)	.88	1.05 (1.01-1.10)	.02	1.07 (1.02-1.12)	.003	1.06 (1.01-1.11)	.02
Donor related to recipient, cystic kidney disease ^b	0.95 (0.82-1.11)	.54	0.99 (0.83-1.18)	.94	0.96 (0.80-1.15)	.64	0.95 (0.79-1.15)	.62
Donor related to recipient, non-cystic kidney disease ^c	0.95 (0.91-0.98)	.003	1.00 (0.96-1.05)	.99	1.08 (1.03-1.13)	.002	1.06 (1.01-1.12)	.01
Donor related to recipient, donor African American ^d	1.11 (0.99-1.24)	.09	1.13 (0.99-1.29)	.07	0.99 (0.86-1.14)	.91	0.98 (0.85-1.12)	.74
Donor related to recipient, donor not African American ^e	0.99 (0.95-1.03)	.55	1.05 (1.00-1.10)	.05	1.05 (1.00-1.10)	.06	1.04 (0.99-1.09)	.16

....genetic or socioenvironmental factors are associated with this finding

...may not be generalizable to other countries given known differences in outcomes for US vs other kidney transplant recipients

Desensitization Rates for NKR Transplants are Dropping



www.kidneyregistry.org administrative database; transplants through 5/1/19

Patients with a calculated panel reactive antibodies (cPRA) lower than 99% can generally find a clean match through the NKR in less than 6 months...

Διεύρυνση της «δεξαμενής» των ζώντων δοτών – ειδικές ομάδες

1. Θεσμοθέτηση και άλλων τύπων ζώντων δοτών

- Κατευθυνόμενη άμεση δωρεά χωρίς γενετική ή συναισθηματική σύνδεση
- Έμμεσα κατευθυνόμενη δωρεά
- Μη κατευθυνόμενη – ανώνυμη δωρεά

Καλής ποιότητας μοσχεύματα - υγιείς δότες
Εξασφάλιση συμβατότητας (ABO-HLA)

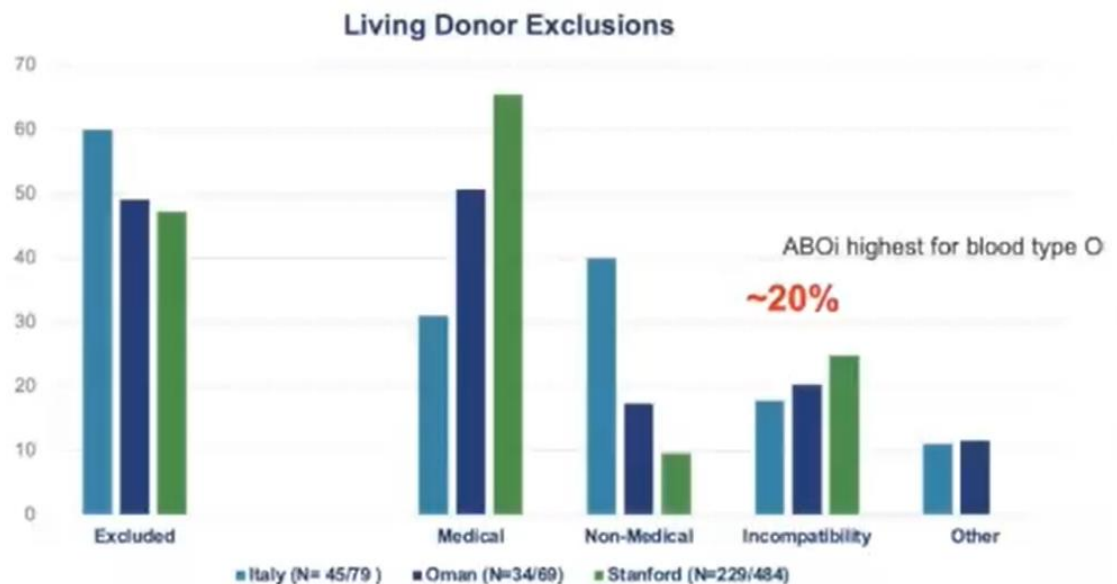
2. Ασύμβατες ΤΧ - Διεύρυνση των κριτηρίων αποδοχής ζώντα δότη

Ασυμβατότητα ABO
Ασυμβατότητα HLA - cross-match
Ηλικιωμένοι
Με συνοσηρότητες (οριακό eGFR, ΑΥ, ΣΔ, παχύσαρκοι, λοιμώξεις)

Οριακά μοσχεύματα και δότες
Υψηλού ανοσολογικού κινδύνου
μεταμοσχεύσεις

3. Οργανωμένα προγράμματα ενημέρωσης-εκπαίδευσης των δοτών
Ψυχολογική υποστήριξη
Άρση οικονομικών φραγμών για τους δότες

Living Donors: ABO Incompatible Kidney Transplant



- Target isoagglutinin Ab titers to ABO blood group of 1:16 or less to proceed with transplantation
- Treatment Approaches
 - Physical Removal of antibodies
 - ❖ Plasmapheresis
 - ❖ Immunoabsorption
 - Targeting the B cell compartment
 - ❖ Splenectomy
 - ❖ Anti-CD20
 - ❖ Proteasome inhibition
 - ❖ IVIG
 - Maintenance Immunosuppression
 - ❖ Control of alloimmune response

Gentry et al. AJT 2005

Lapasia et al, Clin Transp. 2011, Romagnoli et al, Transp. Proc 2013

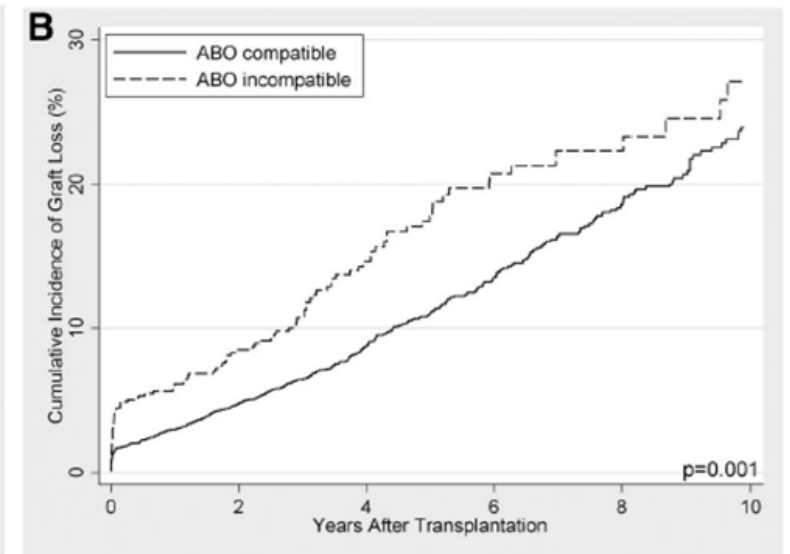
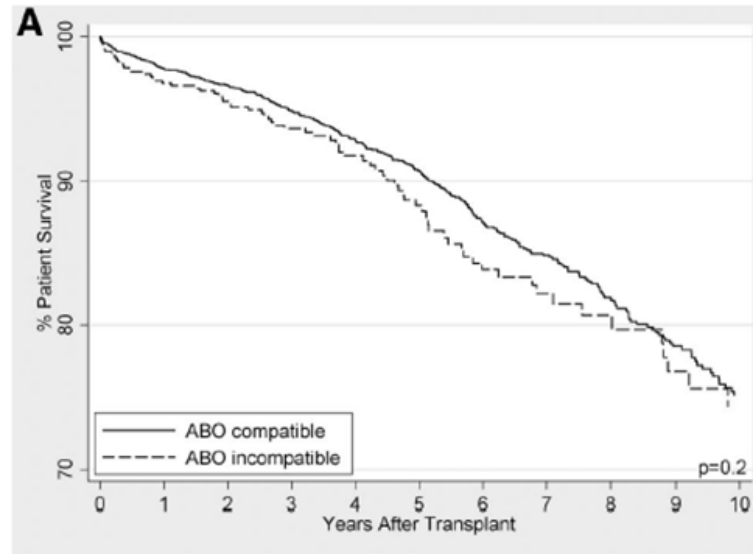
Mohsin et al. Exp Clin Transp 2010, Gentry et al. AJT 2005

Kasiske et al. Clinical Transplantation 2021

ABO Incompatible Living Transplantation outcomes

- ABOi vs ABOc KTx, 1995-2010
 - Increase in graft loss, especially within 1st year
 - No difference in patient survival

ABO Incompatible: 738
 ABO Compatible Matched cohort: 3679
 Matched : age, year of transplant, PRA, XM status, dialysis vintage, diabetes



- ABOi vs ABOc KTx, 2005-2013
 - Excellent long term patient and graft survival

ABO Incompatible: 30
 ABO Compatible Matched cohort: 30
 Matched : baseline characteristics (age, gender, PRA, XM status)

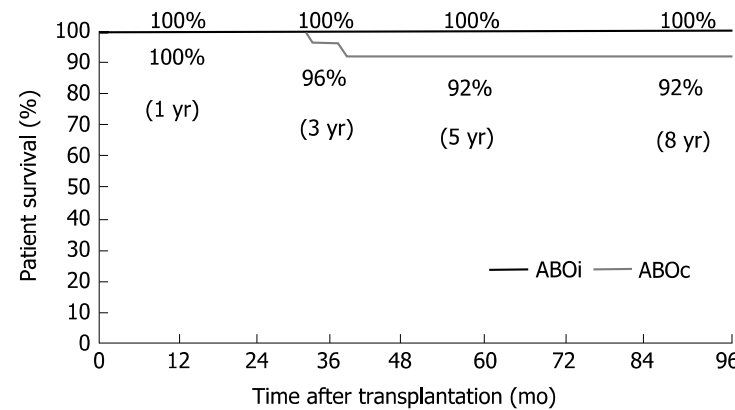


Figure 1 Patient survival (Kaplan-Meier).

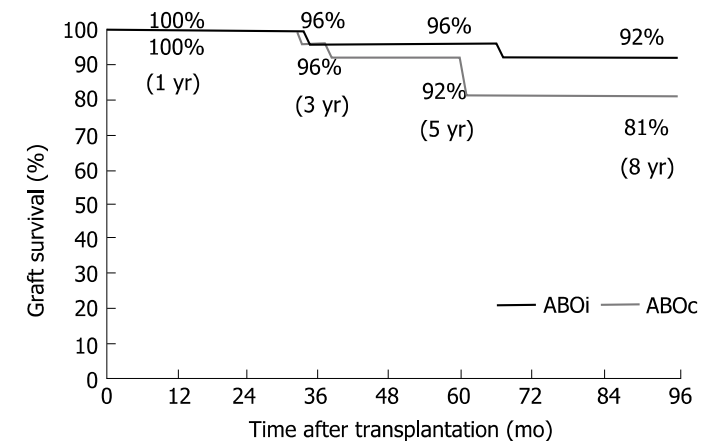
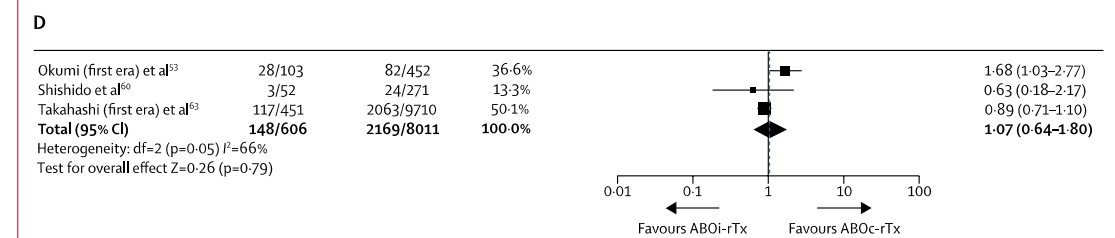
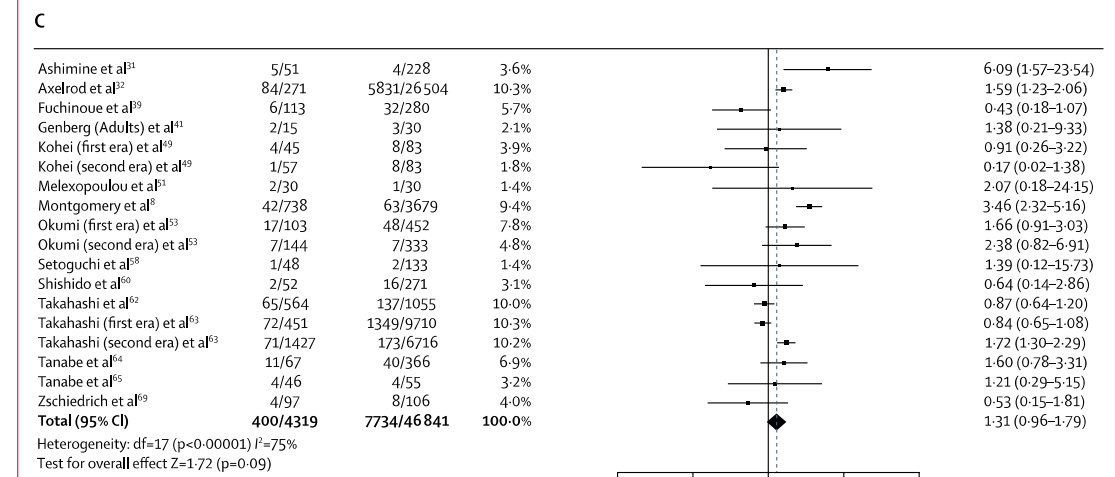
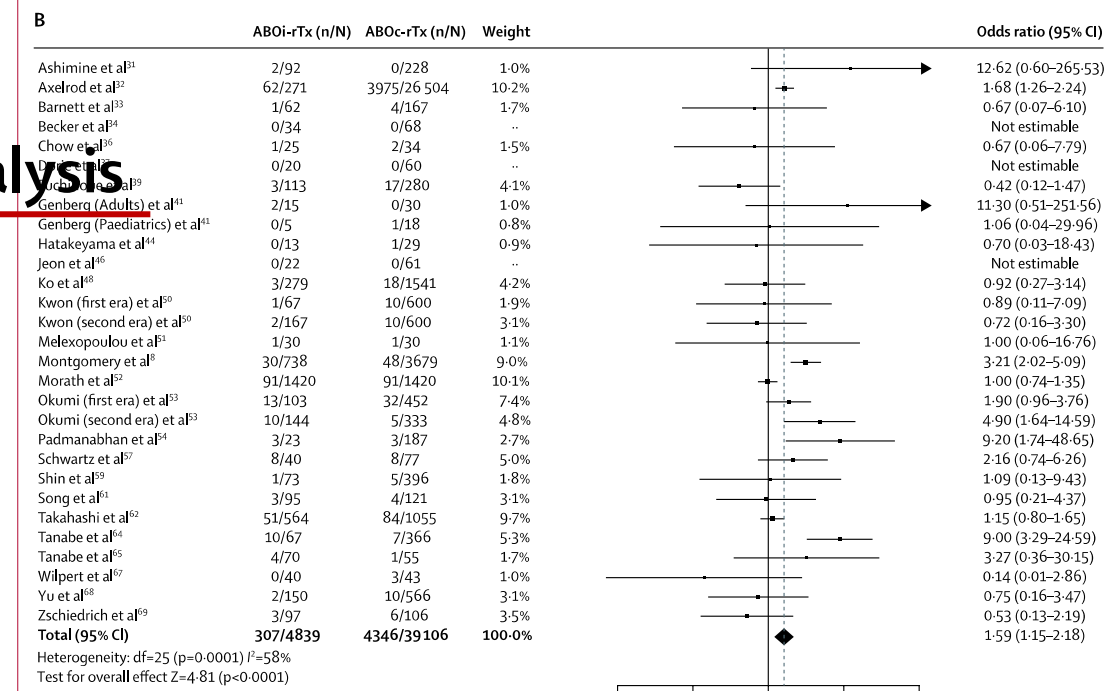


Figure 2 Graft survival (Kaplan-Meier).

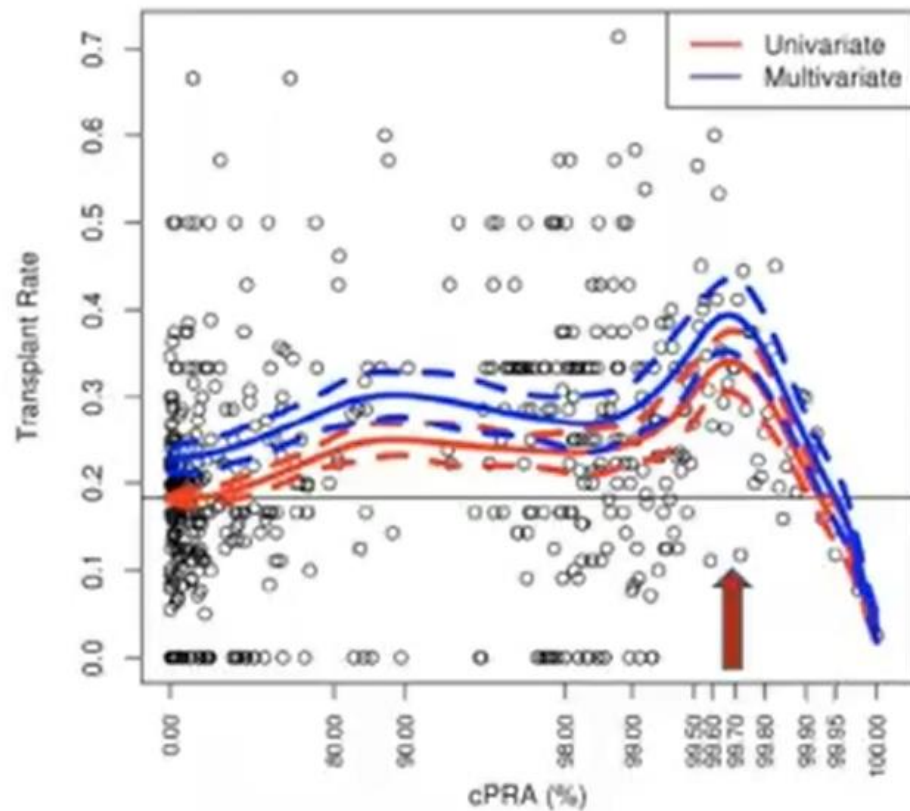
Clinical outcomes after ABO-incompatible renal transplantation: a systematic review and meta-analysis

- 40 studies included
- 65 063 patients were eligible for analysis, **7098 of with ABOi-rTx.**
- **ABOi-rTx compared with ABOc-rTx :**
 - **mortality significantly higher at 1-year (OR 2.17, p<0.0001)**
 - **death-censored graft survival was lower at 1 year (OR 2.52, p<0.0001) and 3 years (OR 1.59, p=0.0040).**
 - **LONG TERM, 5 y and 8y, graft losses and patient survival were equivalent to that of ABOc-rTx**

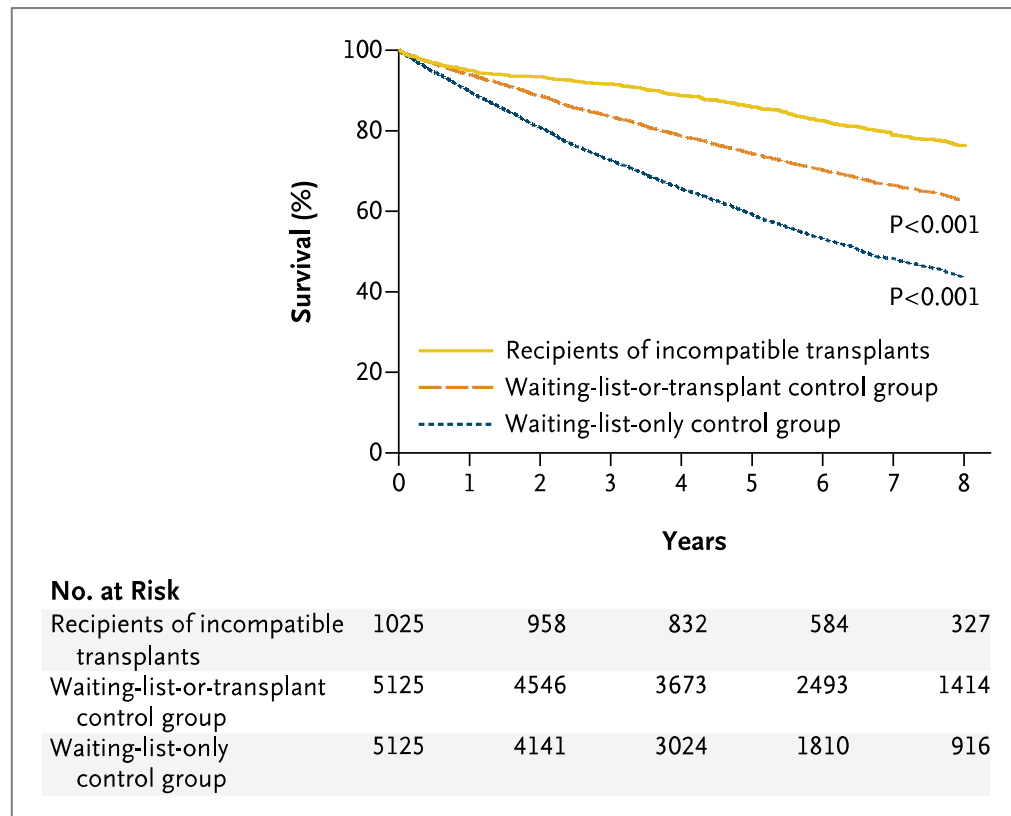


Living Donor Kidney: HLA Incompatibility (+XM)

Lower transplant rates in highly sensitized



Better survival with XM Incompatible Living Donor



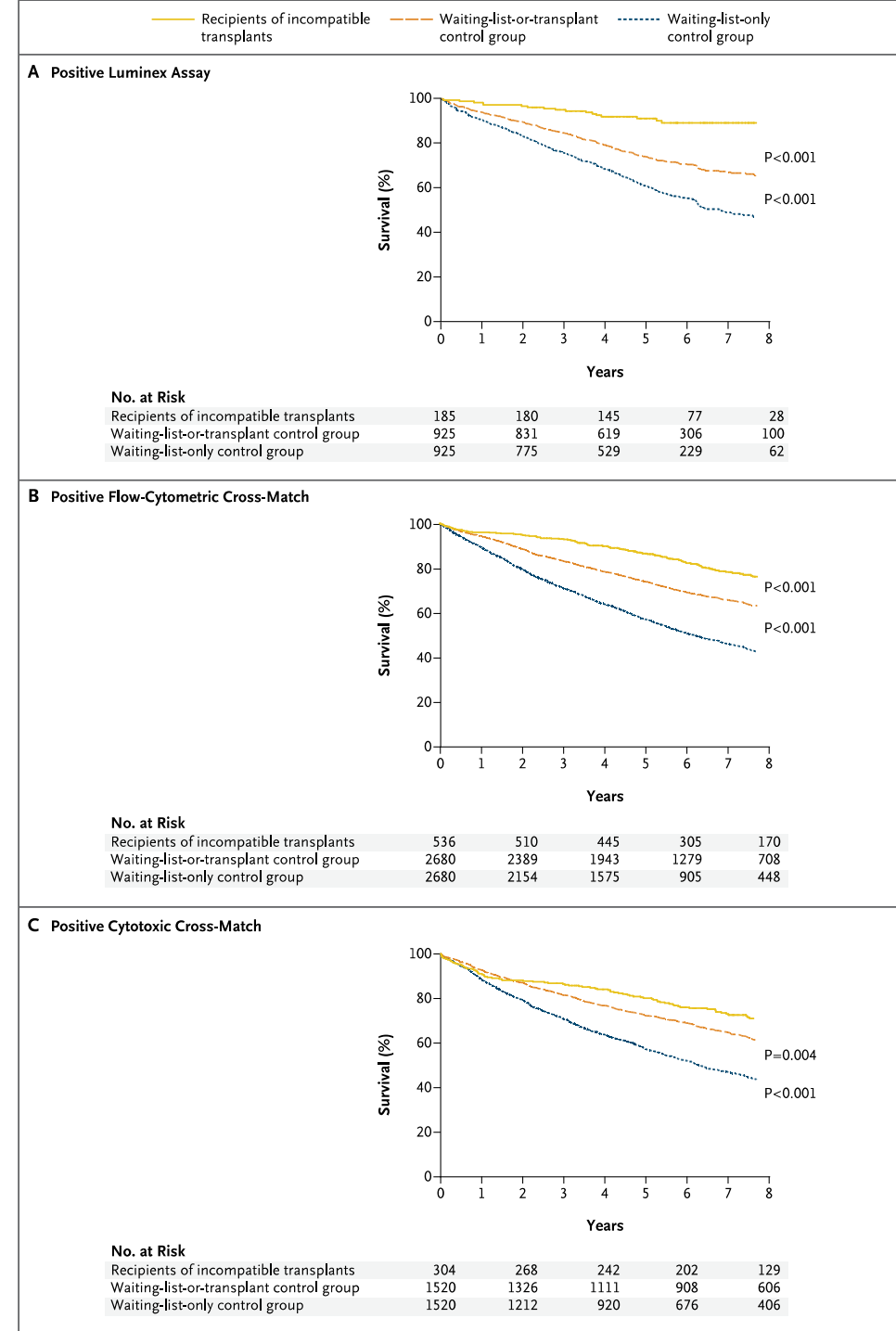
Survival Benefit with Kidney Transplants from HLA-Incompatible Live Donors

Orandi et al. NEJM 2016

- 22-center study, we estimated the survival benefit for 1025 KTR from HLAi LKD

Patient Survival	1 year	3 years	8 years
Luminex	98,4%	95,1%	89,2%
Flow	96,1%	93,3%	76,3%
CDC	91,1%	86,8%	71%
Waiting list -no Tx	89,6%	72,7%	44%
Waiting list – yes Tx compatible	94,0%	83,6%	63%

HLA-incompatible live donors had a substantial survival benefit as compared with patients who did not undergo TX and those who waited for DCD transplants



Living Donor Kidney: XM Incompatibility

- No large RCTs
- Center Differences in Treatment Approaches
- Increased risk for Acute rejection
 - AMR and graft loss
- Relative strength (MFI) and class of DSAs
- Type of rejection
- Time of rejection (14 days)
- No of rejection episodes

- Treatment Approaches and goals
 - Reduction of Antibody
 - Plasmapheresis
 - IVIG
 - IdeS
 - Suppression of B cell Response
 - Anti – CD20
 - Proteasome inhibition
 - IVIG
 - Complement Inhibition
 - IVIG
 - Complement Inhibitors
 - Other Agents – IL6 antagonist
- Maintain Immunosuppression
- Avoiding Infections complications

Long term Living Kidney Donation risks

Small increases in the long-term risks of ESKD, preeclampsia, hypertension, and metabolic diseases
 These risks should be discussed with all donor candidates

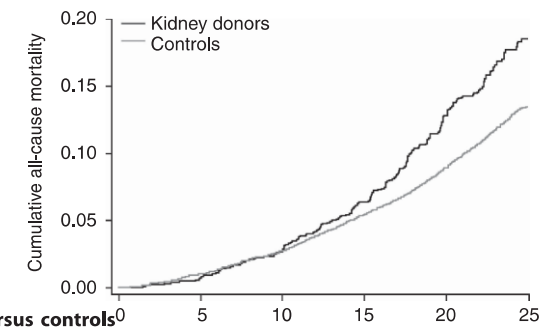
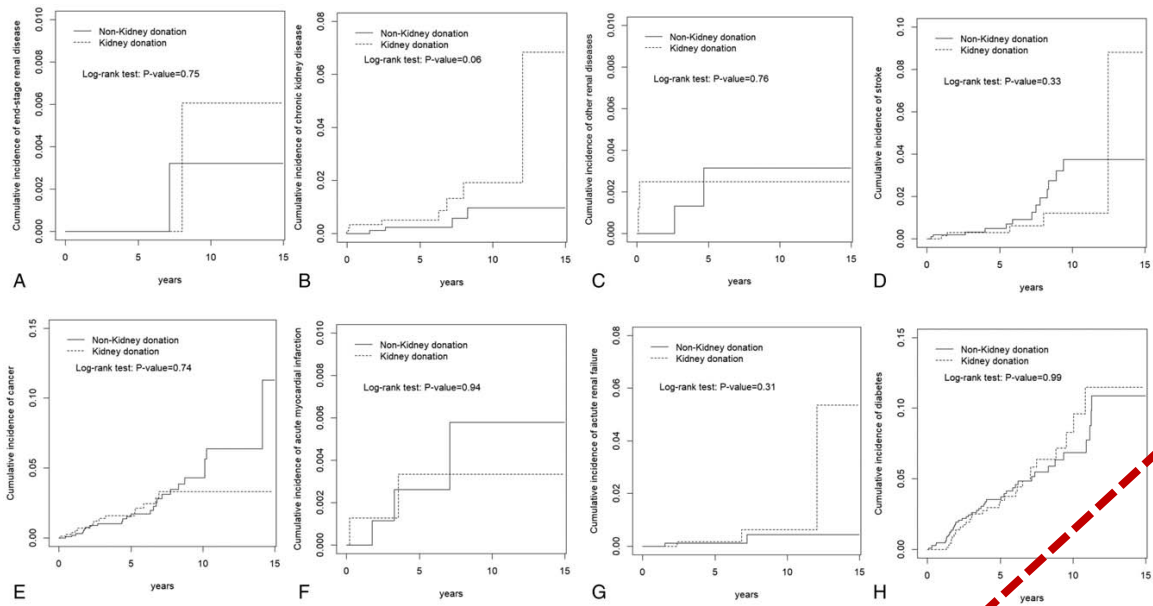


Table 2a | Hazard ratio for death by any cause in kidney donors versus controls

	Unadjusted (n = 27,368-34,522)	Adjusted 1 ^a (n = 2038/27,144)	Adjusted 2 ^b (n = 2649/34,522)
Kidney donation	2.49 (2.13-2.91, P < 0.001)	1.48 (1.17-1.88, P = 0.001)	1.30 (1.11-1.52, P = 0.001)
Inclusion year	0.95 (0.93-0.97, P < 0.001)	0.95 (0.93-0.98, P < 0.001)	0.97 (0.95-0.98, P < 0.001)
Age, years	1.10 (1.10-1.11, P < 0.001)	1.10 (1.10-1.11, P < 0.001)	1.10 (1.10-1.11, P < 0.001)
Male	1.62 (1.49-1.73, P < 0.001)	1.44 (1.32-1.58, P < 0.001)	1.52 (1.41-1.65, P < 0.001)
Systolic BP	1.04 (1.03-1.04, P < 0.001)	1.00 (1.00-1.01, P = 0.45)	1.00 (1.00-1.01, P < 0.24)
Smoking	1.64 (1.50-1.79, P < 0.001)	1.97 (1.80-2.15, P < 0.001)	1.91 (1.74-2.10, P < 0.001)
BMI	1.12 (1.11-1.14, P < 0.001)	1.02 (1.00-1.04, P = 0.06)	1.01 (0.99-1.03, P = 0.21)

Abbreviations: BMI, body mass index; BP, blood pressure.
^aAdjusted for age, gender, year of inclusion, systolic BP, smoking, and BMI.
^bAfter multiple imputation.

Table 2b | Hazard ratio for cardiovascular death in kidney donors versus controls

	Unadjusted (n = 27,368-34,522)	Adjusted 1 ^a (n = 568/27,144)	Adjusted 2 ^b (n = 756/34,522)
Kidney donation	3.18 (2.39-4.23, P < 0.001)	1.52 (0.95-2.43, P = 0.08)	1.40 (1.03-1.91, P = 0.03)
Inclusion year	0.90 (0.87-0.94, P < 0.001)	0.92 (0.87-0.98, P = 0.005)	0.95 (0.92-0.98, P = 0.004)
Age, years	1.13 (1.13-1.14, P < 0.001)	1.13 (1.12-1.14, P < 0.001)	1.13 (1.13-1.14, P < 0.001)
Male	2.23 (1.92-2.60, P < 0.001)	2.04 (1.71-2.44, P < 0.001)	2.04 (1.75-2.38, P < 0.001)
Systolic BP	1.05 (1.05-1.06, P < 0.001)	1.01 (1.00-1.02, P = 0.15)	1.01 (1.00-1.02, P = 0.05)
Smoking	1.82 (1.55-2.14, P < 0.001)	2.30 (1.94-2.72, P < 0.001)	2.10 (1.75-2.51, P < 0.001)
BMI	1.17 (1.14-1.21, P < 0.001)	1.05 (1.01-1.08, P = 0.006)	1.03 (1.00-1.07, P = 0.03)

Living KDs experienced no significant health disorders following kidney donation but should be alert to the higher incidence rate of ARF.

Απόλυτα κριτήρια αποκλεισμού ζώντα δότη

- Ηλικία < 18 έτη, διανοητική ανικανότητα λήψης αποφάσεων μετά από ενημέρωση
- Αρρυθμιστη ΑΥ ή παρουσία τελικού σταδίου προσβολής οργάνου στόχου από την ΑΥ
- ΣΔ τύπου I
- Ενεργός ή ατελώς θεραπευθείσα νεοπλασία
- Ενεργός λοίμωξη
- Μη ελεγχόμενη ψυχιατρική νόσος - αυτοκτονική συμπεριφορά
- Εξαναγκασμός ή οικονομική συναλλαγή μεταξύ δότη-λήπτη

Special Groups of LKD: Medically complex

expanded donor criteria in living donation...

1. **Advanced age:** >55- 60
2. **Predonation “borderline” kidney function :** *GFR 60 to 89 mL/min per 1.73 m²*
3. **Asymptomatic microhematuria**
4. **Albuminuria / Proteinuria :** *AER 30 to 100 mg/d*
5. **Hypertension:** *Hypertension that can be controlled to BP< 140/90 mm Hg using 1 or 2 antihypertensive agents*
6. **Obesity :** *BMI >30 kg/m²*
7. **Prediabetes or type 2 diabetes**
8. **Nephrolithiasis**
9. **Chronic viral infections :** HBV, HCV, HIV
10. **History of malignancy:** *Past history of treated malignancies with a "low" risk (<1%) of transmission or recurrence*

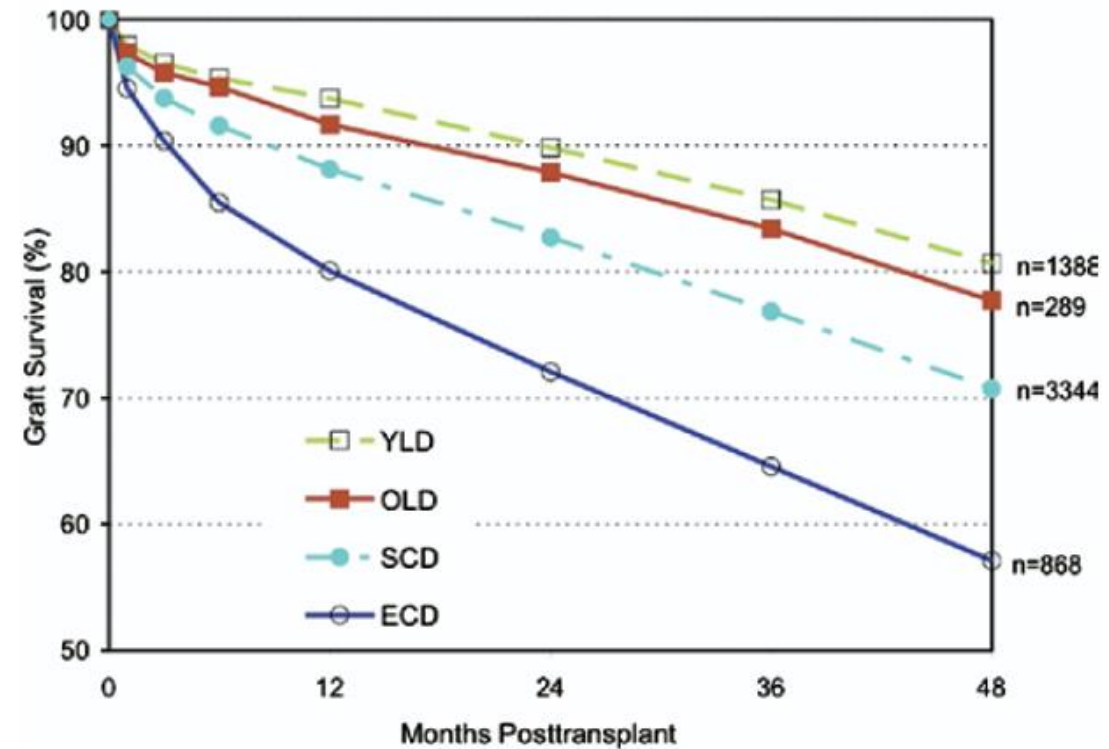
Outcomes of Kidney Transplantation From Older Living Donors to Older Recipients - OPTN/UNOS

23,754 kidney TX performed in recipients > 60 years , period 1996-2005
 7,006 LKD : 1,133 were > 55 years OLD and 5,873 were <or= 55 years YLD
 Deceased 12,197 from SCDs, and 4,551 from ECDs

Univariate and Multivariate Analysis for Relative Risk of Overall Allograft Loss in Elderly Recipients

	Univariate		Multivariate	
	RR (95% CI)	P	RR (95% CI)	P
OLD (reference)	1.00	<0.001	1.00	
YLD	0.79 (0.68-0.91)		1.00 (0.47-2.13)	0.9
SCD	1.27 (1.11-1.45)		1.66 (0.83-3.32)	0.2
ECD	2.05 (1.79-2.36)		2.36 (1.18-4.74)	0.02
Donor sex				
Men (reference)	1.00		1.00	
Women	1.07 (1.01-1.12)	0.03	1.09 (1.03-1.16)	0.003
Donor history of hypertension				
Nonhypertensive	1.00		1.00	
History of hypertension	1.51 (1.42-1.61)	<0.001	1.23 (1.14-1.32)	<0.001
Recipient age ≥ 70 y	1.29 (1.21-1.38)	<0.001	1.26 (1.17-1.36)	<0.001
Recipient race				
Non-African American	1.00		1.00	
African American	1.33 (1.25-1.41)	<0.001	1.18 (1.10-1.26)	<0.001
HLA-DR mismatch				
0	1.00		1.00	
≥1	1.17 (1.08-1.27)	<0.001	1.15 (1.05-1.26)	0.002
Dialysis duration (mo)				
<48	1.00		1.00	
>48	1.50 (1.41-1.60)	<0.002	1.29 (1.21-1.38)	<0.001
Cause of ESRD				
Other	1.00		1.00	
Diabetes mellitus	1.21 (1.14-1.28)	<0.001	1.24 (1.16-1.32)	<0.001
PRA < 50%	1.00		1.00	
PRA > 50%	1.27 (1.16-1.40)	<0.001	1.25 (1.12-1.38)	<0.001
Primary transplant	1.00		1.00	
Regraft	1.21 (1.07-1.36)	0.002	1.19 (1.04-1.36)	0.01

Note: Donor race was nonsignificant on univariate analysis. Interaction between recipient age and donor category was nonsignificant.



Acceptability of older adults as living kidney donors



- **10-year incidence of death & cardiovascular disease for older LKDs:** at least similar to, if not lower than the general population and health matched nondonors.
- **Relative risk of ESKD in older LKDs:** higher than in a selected group of healthy nondonors.
- Reassuringly, the risk in older LKDs is lower than the general population with a low absolute 15- year incidence of less than 1%.

Estimation of kidney function – GFR / Borderline kidney function

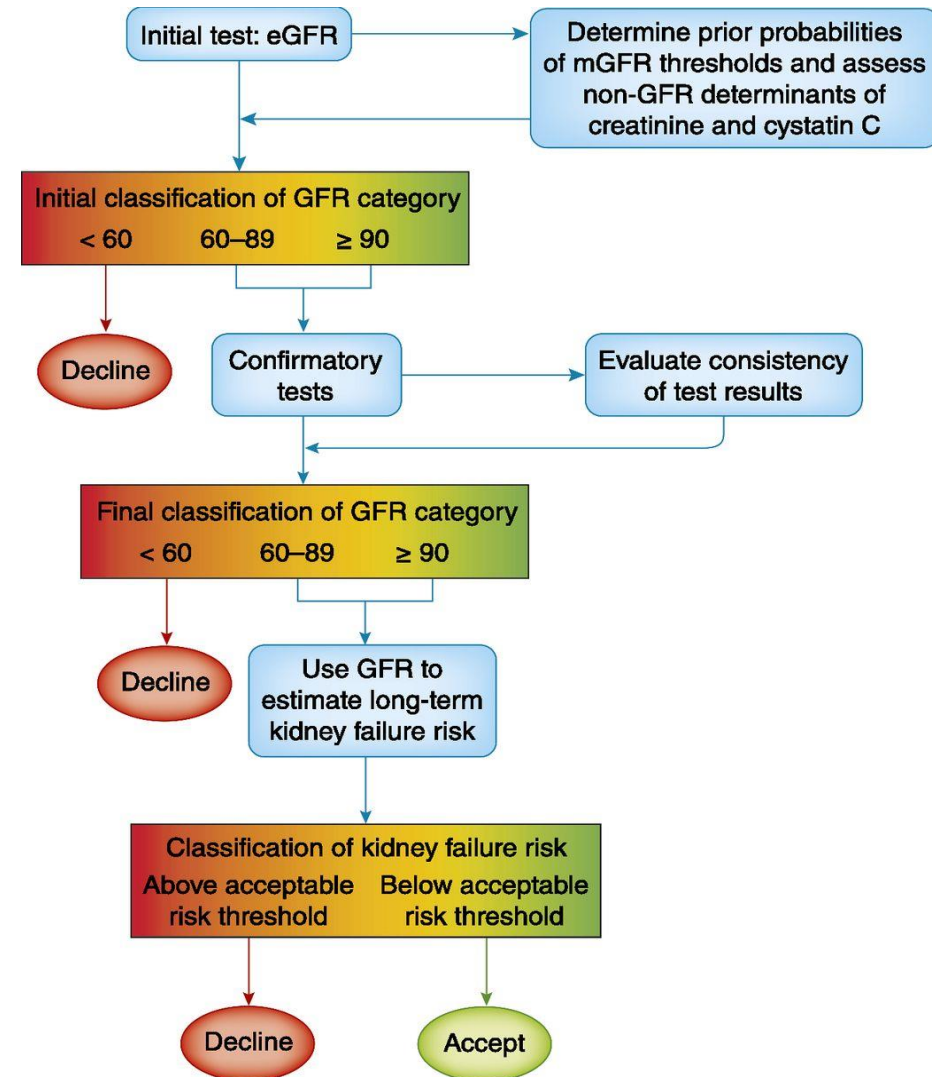
eGFR-creatinine
 eGFR-cystatin / eGFR-cr-cys
 mCrCl
 mGFR (⁵¹CrEDTA, 125 I-iothalamate or iohexol)

Acceptable: $GFR > 90 \text{ ml/min/1.73m}^2$

Borderline: $60 < GFR < 89 \text{ ml/min/1.73m}^2$

Decline: $GFR < 60 \text{ ml/min/1.73m}^2$

If GFR borderline : the decision to approve should be individualized based on demographic and health profile
 Projected risk of kidney failure estimated from simultaneous consideration of all baseline factors



Calculation of PRE/POST - donation Kidney failure risk

3 PREDICTIVE EQUATIONS were recently developed to provide predonation estimates of postdonation ESKD and low GFR based on a combined set of candidate predonation characteristics – some limitations...



Renal Function Profile in White Kidney Donors: The First 4 Decades

Hassan N. Ibrahim,* Robert N. Foley,* Scott A. Reule,* Richard Spong,* Aleksandra Kukla,* Naim Issa,* Danielle M. Berglund,[†] Gretchen K. Sieger,[†] and Arthur J. Matas[‡]

Kidney-Failure Risk Projection for the Living Kidney-Donor Candidate



Quantifying Postdonation Risk of ESRD in Living Kidney Donors

Allan B. Massie,^{*†} Abimeraki D. Muzale,^{*†} Xun Luo,^{*†} Eric K.H. Chow,^{*†} Jayme E. Locke,[‡] Anh Q. Nguyen,^{*†} Macey L. Henderson,^{*†} Jon J. Snyder,[§] and Dorry L. Segev^{*†§}



- **NEW - Benoit's equation** (*Transplantation*, November 2021)
- Equation that can be used in the predonation period to estimate GFR 1 y after donation:

$$\text{postoperative eGFR} = 31.71 + (0.521 \times \text{preoperative eGFR}) - (0.314 \times \text{age in years at donation})$$

Calculation of Kidney failure risk

<http://www.transplantmodels.com/esrdrisk/>

- **Pre-donation projected risk of ESKD (in the absence of kidney donation):**
This model is intended for low-risk adults considering living kidney donation in the United States

- **Post-donation projected risk of ESKD (after kidney donation):**
Previous studies have estimated that the 15-year absolute increase in the risk of ESRD from kidney donation averages 0.27%
Post donation lifetime risk (x5)

- **Post donation lifetime risk $0.30 \times 5 = 1.5\%$**
- **eGFR 1 y post donation = 69ml/min/1.73m²**

Projected Incidence of End-Stage Renal Disease:	
0.04% Pre-Donation 15-Year*	0.30% Pre-Donation Lifetime*
?	?
Post-Donation 15-Year**	Post-Donation Lifetime**

blue: < 1%, green: 1-2%, yellow: 2-3%, orange: 3-5%, red: >5%

The pre-donation risks represent projections if a person does not donate a kidney. Details about estimating post-donation risk are provided below.

[reset](#) [print summary](#)

Patient Characteristics:

Age (18-80yrs)	40
Gender	Female
Race (White or Black)	White
eGFR (mL/min/1.73m ²)	90
Systolic Blood Pressure (mmHg)	120
Hypertension Medication	No Medication
BMI (kg/m ²)	25
Non-Insulin Dependent Diabetes	No Diabetes
Urine Albumin to Creatinine (mg/g) <small>click on units to change between mg/g and mg/mmol</small>	4
Smoking History	Non-Smoker

Estimation of albuminuria / proteinuria

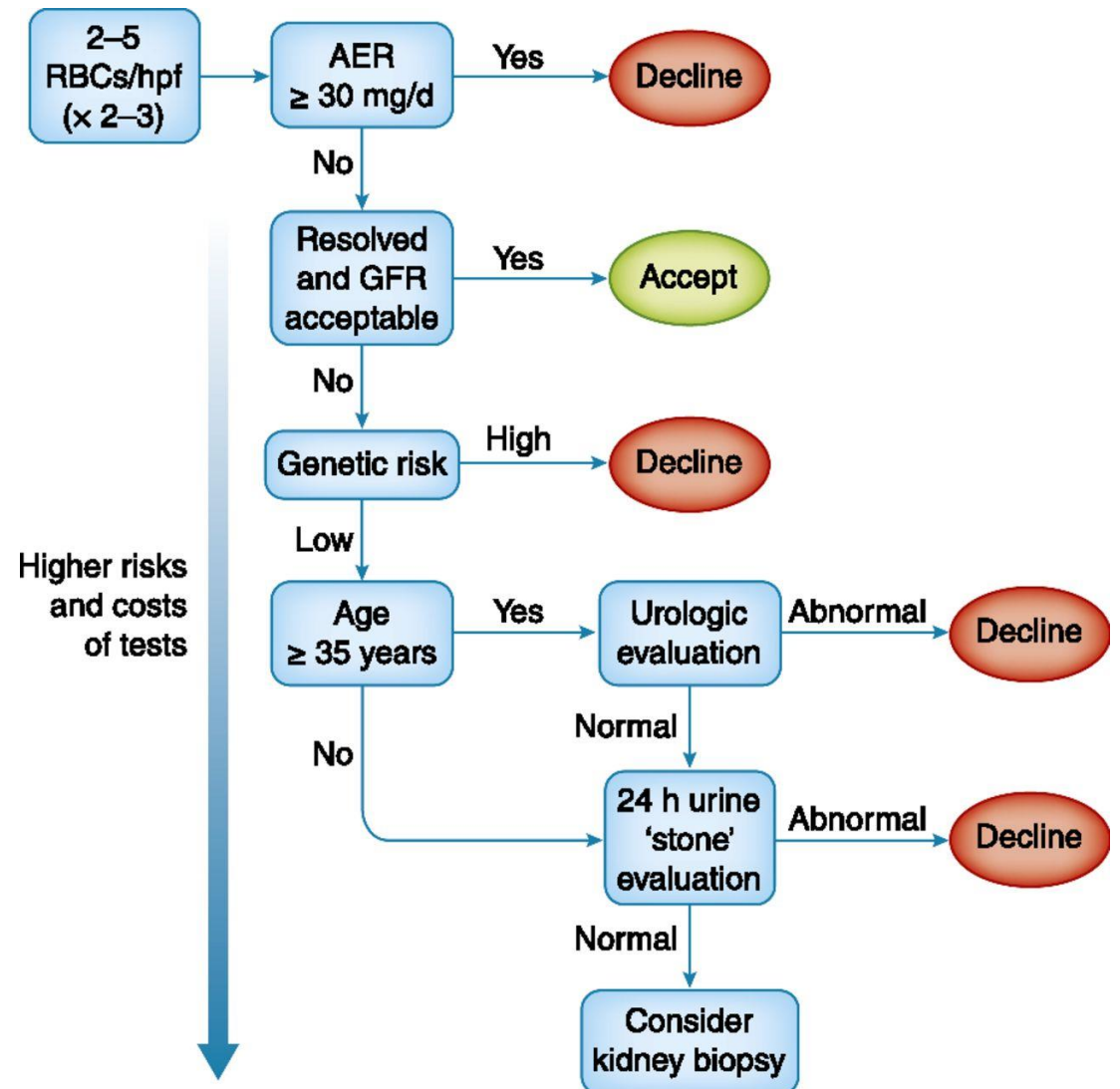
Acceptable: AER < 30 mg/d, ACR < 30 mg/g

Decline: AER > 300 mg/d – ACR > 300 mg/g

PER > 500 mg/d - RCR > 500 mg/g

- We do not exclude candidates solely on the basis of **AER 30 – 100 mg/ d**
- **If AER borderline** : the decision to approve should be individualized based on demographic and health profile

Estimation of asymptomatic micro-hematuria



Hypertensive living kidney donors

- Hypertension is a risk factor for kidney and cardiovascular disease
- Donor should be evaluated for other CAD risk factors
- If unclear history for hypertension, blood pressure should be further evaluated using ambulatory blood pressure monitoring or repeat standardized blood pressure measurements
- ***Acceptable candidate with BP<140/90 mmHg using 1-2 antihypertension agents with no evidence of target organ damage***
- The decision to approve donation should be individualized based on demographic and health profile in relation to the transplant program's acceptance risk threshold
- Donor candidates should be counseled on lifestyle interventions to address modifiable risk factors for hypertension and cardiovascular disease

Obesity & Metabolic disorders (preDM or DMII)

- Acceptable BMI $<30 \text{ kg/m}^2$
- **Borderline** $30 < \text{BMI} < 35 \text{ kg/m}^2$
with thorough evaluation of candidate, exclusion of other comorbidities i.e. CKD, CAD, COPD, suggestion for body weight loss
- **Decline:** BMI $> 35 \text{ kg/m}^2$

For **Borderline candidates** decision should be individualized based on demographic and health profile in relation to the transplant program's acceptance threshold

- **Borderline: PreDM & DM-II**
- Evaluation for history of diabetes mellitus, gestational diabetes, and family history of diabetes
- Fasting blood glucose and/or glycated hemoglobin (HbA1c)
- **DM-I do not donate**

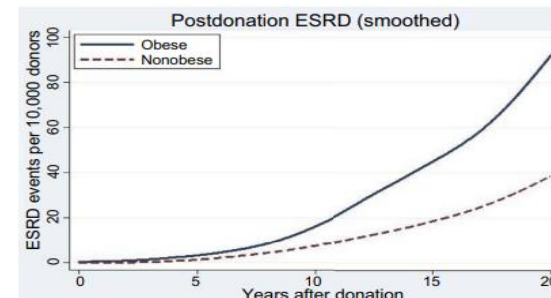
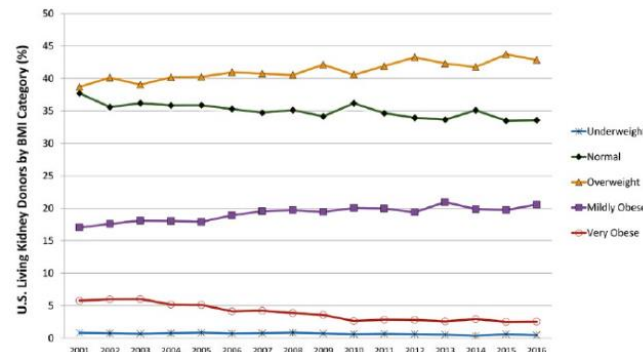


Figure 1 | Cumulative incidence of postdonation end-stage renal disease (ESRD) events among living kidney donors by obesity status at time of donation.

Prospective cohort

Impact of obesity in kidney transplantation

Background



Obese transplant recipients have a better survival rate than those undergoing dialysis



This study compares the impact of obesity and pre-transplant weight loss on patient and graft survival

Methods



Data from two French registries (2008–2014)



Kidney transplant recipients (KTR)



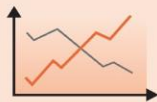
Comparisons:

- Obese (BMI ≥ 30 kg/m²) vs. non-obese (BMI < 30 kg/m²)
- Weight loss ($\geq 10\%$ body weight) vs. $< 10\%$ body weight loss or weight gain



Outcomes:

- Patient survival
- Graft failure



N = 7270
KTR



32 kg/m²
Mean BMI

Results



Patient survival



Graft failure

HR (95% CI) vs. non-obese patients

0.94
(0.73–1.23)

1.40
(1.09–1.78)

HR (95% CI) vs. obese patients with no weight loss

0.79
(0.35–1.77)

2.17
(1.02–4.63)

Conclusion

Obesity is not a risk factor for excess mortality after kidney transplantation and should not therefore be an obstacle to having access to a graft. Pre-transplantation weight loss is not associated with improved outcomes in kidney transplant recipients.

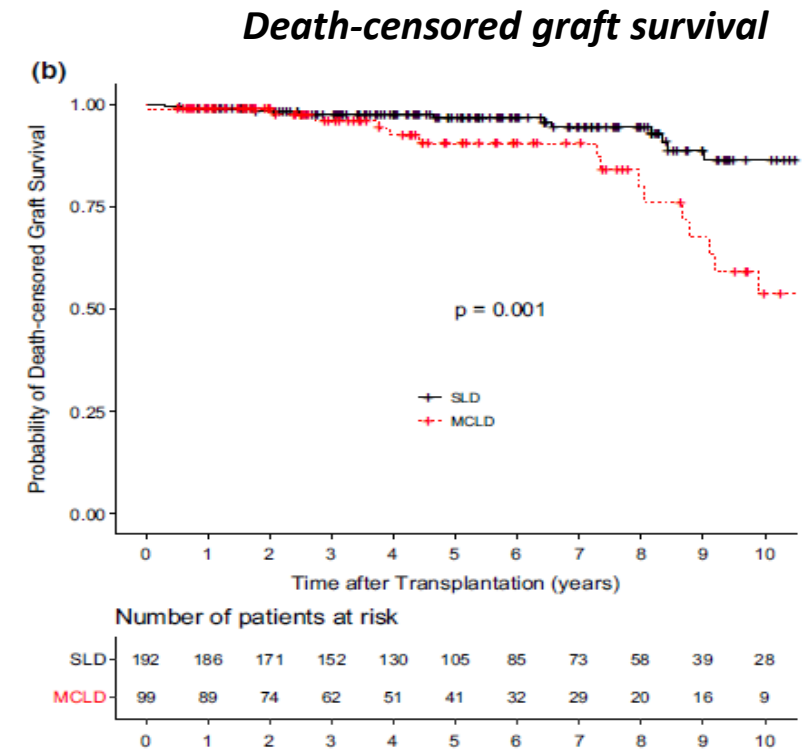
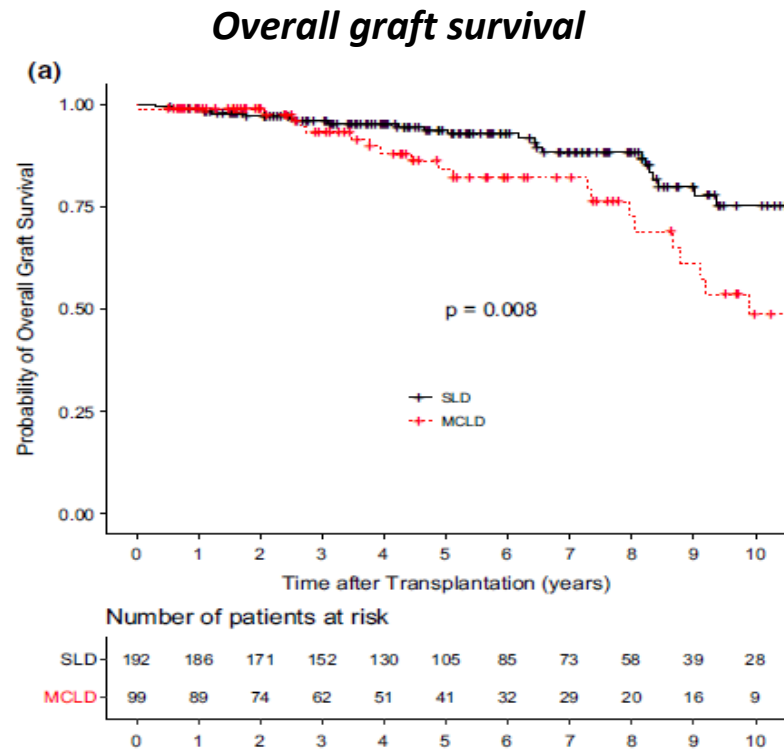
Clinical outcomes in donors and recipients of kidney transplantations involving medically complex living donors – a retrospective study

Demographics and baseline characteristics of recipients and donors

Variable	Medically complex living donors (n = 99)	Standard living donors (n = 192)
Recipients		
Age, years; mean (SD)	48.3 (12.9)	47.6 (13.3)
Male, n (%)	58 (58.6)	116 (60.4)
Primary disease leading to transplantation, n (%)		
Glomerulonephritis	37 (37.4)	75 (39.1)
Diabetes mellitus	28 (28.3)	36 (18.8)
Polycystic kidney disease	4 (4.0)	14 (7.3)
Hypertension/nephrosclerosis	3 (3.0)	10 (5.2)
Unknown	11 (11.1)	24 (12.5)
Others	16 (16.2)	33 (17.2)
Duration of dialysis, years; median (IQR)	1.42 (0.28–3.31)	1.54 (0.61–3.86)
ABO-incompatible, n (%)	25 (25.3)	65 (33.9)
Donor-specific antibody-positive, n (%)	10 (10.1)	15 (7.8)
Donors		
Age, years; mean (SD)	64.1 (9.3)	54.9 (9.9)
Male, n (%)	51 (51.5)	71 (37.0)
HLA-A, B, DR matching		
Numbers of mismatches, mean (SD)	3.1 (1.6)	3.3 (1.6)
No mismatch kidney, n (%)	6 (6.1)	12 (6.2)
Relationship between donors and recipients, n (%)		
Donation to spouse	36 (36.4)	95 (49.5)
Donation to child	56 (56.6)	60 (31.2)
Donation to sibling	5 (5.1)	22 (11.5)
Donation to parent	0 (0.0)	10 (5.2)
Donation to other relative	2 (2.0)	5 (2.6)
Pre-donation eGFR, ml/min/1.73 m ² ; mean (SD)	86.1 (17.7)	89.6 (19.4)
Medically complex factor, n (%)		
Hypertension	65 (65.7)	
Elderly (age of 71–80 years)	30 (30.3)	
Diabetes mellitus	22 (22.2)	
Reduced renal function*	5 (5.1)	
Obesity (BMI of 30–32 kg/m ²)	5 (5.1)	
Number of medically complex factors, n (%)		
1	75 (75.8)	
2	20 (20.2)	
3	4 (4.0)	

- *Retrospective study*
- *Clinical data on patients who underwent living donor (LD) KTx from 2006–2019 in Japan*
- **192 standard LDs and 99 medically complex LD**
- *elderly (71-80 yo) 30%*
- *with hypertension 65%*
- *obesity 5%*
- *DM 22%*
- *reduced renal function 5%*

Higher incidence of overall and death-censored graft loss in the recipients who received kidneys from MCLDs (HR = 2.16 and 3.25, P = 0.015 and 0.004) after adjustment for recipient related variables (age, gender, time on dialysis, ABOc, DSAs)



✓ The donation did not adversely affect the MCLDs' renal health at least in the short-term.

	Estimated value (95% CI)	P value
Mean eGFR differences at the postdonation baseline*		
In MCLDs vs. SLDs	-2.25 (-4.47 to -0.40)	0.048
Mean eGFR changing slope per year		
In SLDs	0.26 (-0.03 to 0.56)	0.078
In MCLDs	0.27 (-0.51 to 1.09)	
In MCLDs vs. SLDs	0.01 (-0.52 to 0.54)	0.971

Adjusted for sex.

CI, confidence interval; MCLD, medically complex living donor; SLD, standard living donor.

*The postdonation baseline means when the variable "time points (in years) at which the respective eGFR measurement was obtained" is zero.

HBV+ Living Donation

- Δότης HBsAg(+)**

Με HBV-DNA (+) πρέπει να λάβει αντιική θεραπεία για την αρνητικοποίηση του ιικού φορτίου

→ Σε HBsAg(+) λήπτη

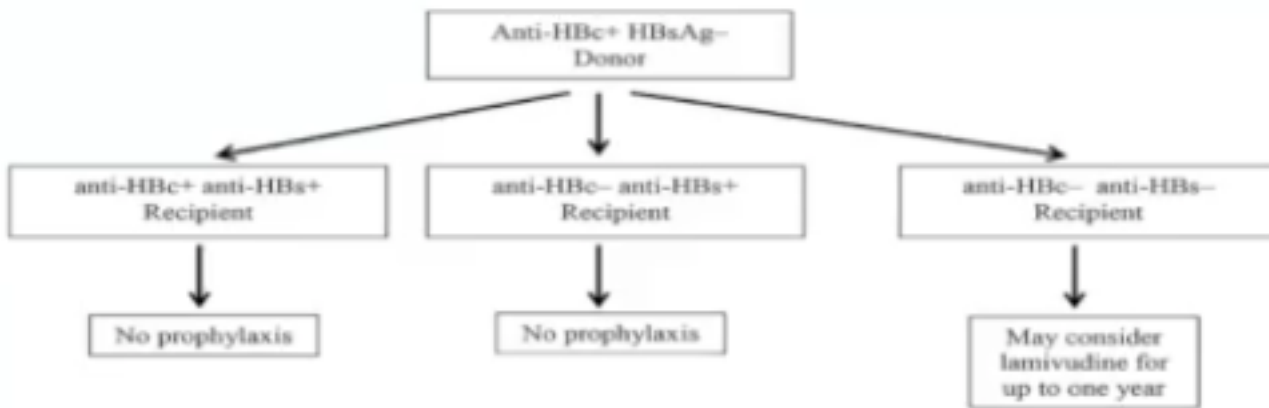
→ Σε HBsAg(-) λήπτη / anti-HBs(+) >100miU/mL → προϋποθέτει ενημέρωση και έγγραφη συγκατάθεση του λήπτη

- Δότης με HBsAg(-), anti-HBc(+), anti-HBs(+/-)**

Χαμηλός κίνδυνος μετάδοσης

Παρακολούθηση λήπτη με HBV-DNA,

Σε anti-HBc(-)/anti-HBs(-) λήπτη χορήγηση lamivudine για 1 έτος, χορήγηση HBIG?



Medication	Potency	Resistance Barrier	Toxicity
Lamivudine	++	+	Lactic acidosis, pancreatitis
Emtricitabine	++	+	Lactic acidosis, anemia, ↓wbc
Adefovir	+	++	Renal
Telbivudine	+++	+	Myopathy, neuropathy
Entecavir	+++	+++	Lactic acidosis, ↑LFTs, myalgia
Tenofovir (TAF/TDF)	+++	+++	GI, rash, ↓ bone mineral density, renal (ARF, acute interstitial nephritis, Fanconi syndrome)

HIV+ and HCV+ living kidney donation

HCV+ Living Donation

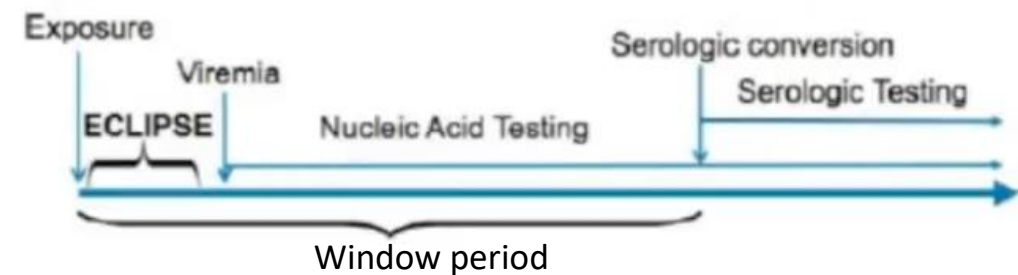
- HCV-Ab(+)/NAT(-) LKD → HCV-Ab(+) or HCV-Ab(-) recipient
- HCV-Ab(+)/NAT(+) LKD without cirrhosis should be treated with DAAs to eliminate viral
- LKD NAT(+) should be paired with NAT(+) recipients to limit the risk of HCV transmission and loss of organs from the donor pool. Both the donor and recipient can be treated safely after TX with DAAs.
- *Transplantation of HCV- recipients with HCV+ kidneys is still investigational and more evidence is needed long-term*

HIV+ Living Donation

In US, the HOPE act permits the donation to HIV+ recipients BUT there is very no clinical experience

HCV “positive” donor definition

HCV Ab	HCV NAT	Means	Transmit Infection
+	+	Active infection	Yes
+	-	Cleared/ Treated/ False +	ND
-	+	WP infection/ False +	Yes



LKD with Cancer

- **Absolute contraindication: Active malignancy**

Previous cancer and fitness for living donation.

Recommendation	Type of cancer
Absolute contraindication	Melanoma Testicular cancer Renal cell carcinoma* Choriocarcinoma Hematological malignancy Lung carcinoma Breast cancer Monoclonal gammopathy

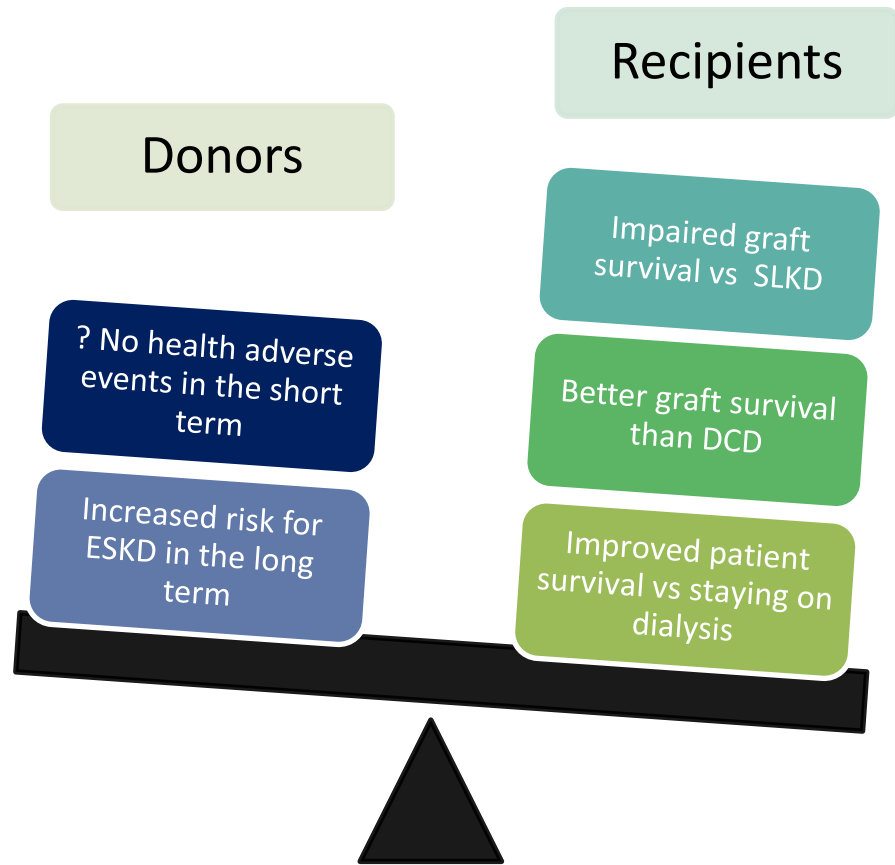
- **Possible donation** : complete cure of Ca, at least 5-10 years free of disease, recent pre-donation evaluation negative for relapse

- **No contraindication:**

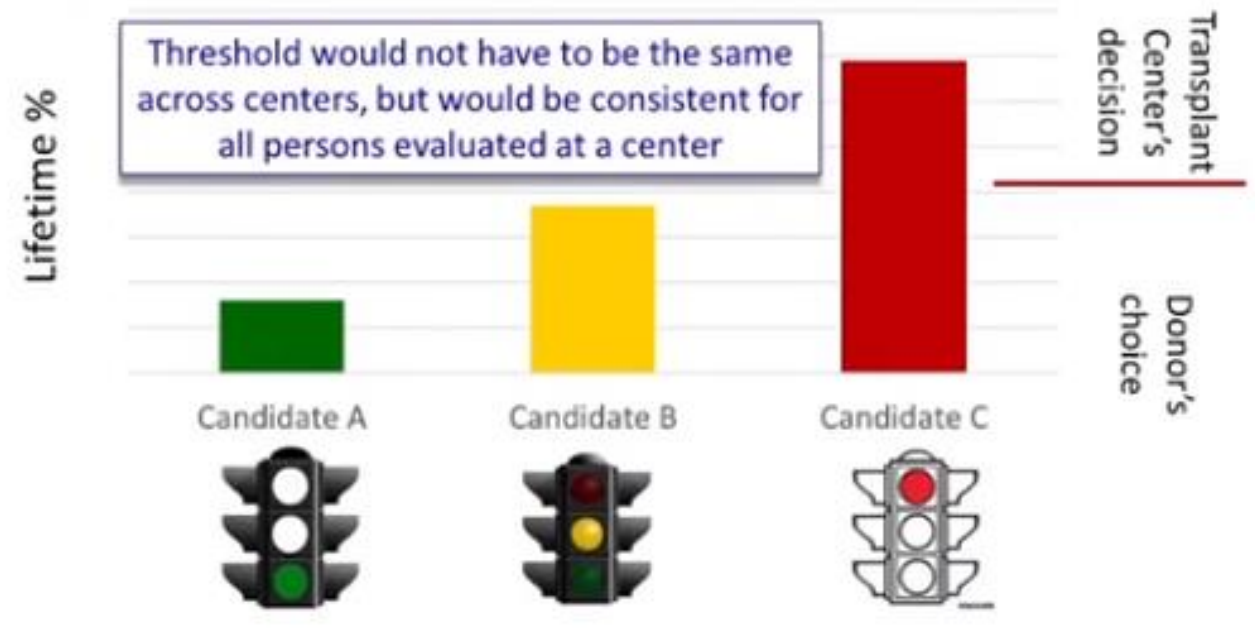
Risk category	Malignancies
Minimal risk (<0.1% transmission)	Basal cell carcinoma, skin Squamous cell carcinoma, skin without metastases Carcinoma in situ, skin (nonmelanoma) In situ cervical carcinoma In situ vocal cord carcinoma Superficial (noninvasive) papillary carcinoma of bladder (TONOMO by Solitary papillary thyroid carcinoma, ≤0.5 cm Minimally invasive follicular carcinoma, thyroid, ≤1.0 cm (Resected) solitary renal cell carcinoma, ≤1.0 cm, well differentiated

Management of marginal – medical complex LKD

It's a matter of balance...



- Careful evaluation of MCLD
- Precise and clear information of benefits and risks both for donors and recipients –short and long term
- The decision to approve donation should be individualized based on demographic and health profile in relation to the transplant program's acceptance risk threshold



Increase LKD - Balancing Act

More than 50 yrs later, we continue to try balance:

DONOR RISKS

Short-term
Long-term

- Medical
- Psychosocial
/ financial



BENEFITS

- Improved recipient health
- Psychosocial benefits of altruism

ΕΥΧΑΡΙΣΤΩ ΓΙΑ ΤΗΝ ΠΡΟΣΟΧΗ ΣΑΣ

A Scoping Review for Strategies to Increase Living Kidney Donation

- A paucity of high-quality studies showing effectiveness of various strategies to address the shortage of living kidney donors.
- Recipient-based education that reaches family and friends has the best evidence of being effective.

- **Novel interventions**

- ✓ Use of a web-based self-screen tool that increases the number of contacts with the transplant center.
- ✓ Use of a multidisciplinary team
- ✓ Use of a live donor champion to help the patient navigate through the process of living donation.



Council of Europe Convention against Trafficking in Human Organs

Santiago de Compostela, 25.III.2015

United Nations

A/RES/71/322



General Assembly

Distr.: General
25 September 2017

Seventy-first session
Agenda item 106

Resolution adopted by the General Assembly on 8 September 2017

[without reference to a Main Committee (A/71/L.80 and Add.1)]

- 71/322. **Strengthening and promoting effective measures and international cooperation on organ donation and transplantation to prevent and combat trafficking in persons for the purpose of organ removal and trafficking in human organs**



The **DECLARATION** of **ISTANBUL**
on **ORGAN TRAFFICKING** and **TRANSPLANT TOURISM**



THE DECLARATION OF ISTANBUL ON ORGAN TRAFFICKING AND TRANSPLANT TOURISM (2018 Edition)



THE DECLARATION OF ISTANBUL ON ORGAN TRAFFICKING AND TRANSPLANT TOURISM (2018 Edition)

Organ trafficking consists of any of the following activities:

- (a) removing organs from living or deceased donors without valid consent or authorisation or in exchange for financial gain or comparable advantage to the donor and/or a third person;
- (b) any transportation, manipulation, transplantation or other use of such organs;
- (c) offering any undue advantage to, or requesting the same by, a healthcare professional, public official, or employee of a private sector entity to facilitate or perform such removal or use;
- (d) soliciting or recruiting donors or recipients, where carried out for financial gain or comparable advantage; or
- (e) attempting to commit, or aiding or abetting the commission of, any of these acts.¹

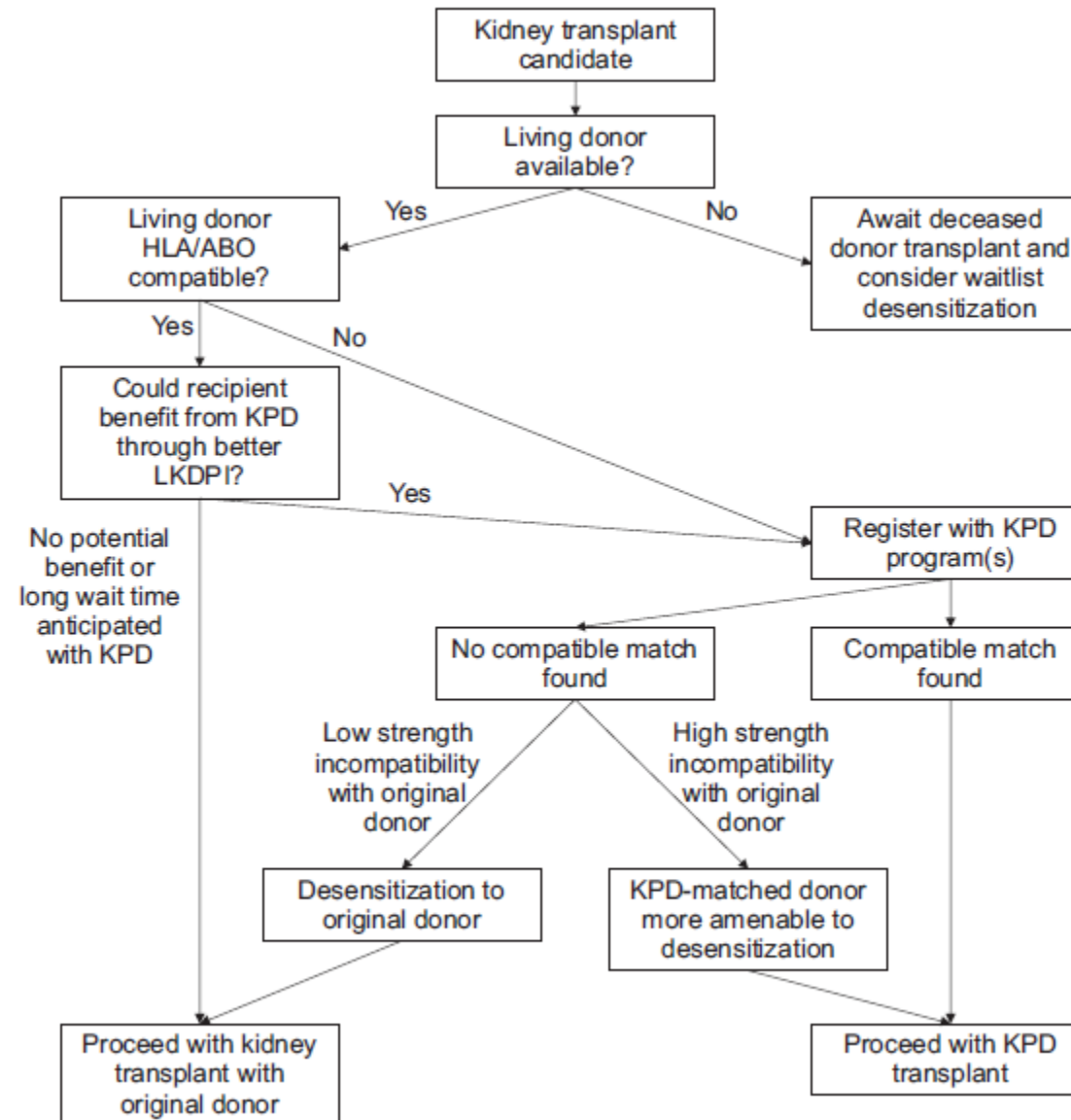
Travel for transplantation: reported number of patients and their departure and destination countries during a period of 42 years

- 86 published studies
- 2000 -2015

Departure countries	No. of patients	Destination countries	No. of patients
Taiwan	1227	China	2700
South Korea	1122	India	817
Malaysia	607	Pakistan	367
Nepal	452	The Philippines	83
Turkey	363	Egypt	68
Singapore	328	United States of America	64
Saudi Arabia	324	South Korea	33
United Kingdom	309	Iran	31
United States of America	246	Iraq	31
Hong Kong	128	United Kingdom	8
Canada	128	Japan	6
Egypt	122	Germany	5
Macedonia	51	Tunisia	5
Dubai	51	Lebanon	4
Brunei	47	France	4
The Netherlands	45	Russia	3
Argentina	40	Syria	2
Mongolia	33	Lebanon	2
Japan	24	Mexico	2
Tunisia	20	Guyana	2
Kuwait	16	Peru	1
Australia	16	Israel	1
Ivory Coast	16	Thailand	1
Israel	11	Nepal	1
Sweden	3	Turkey	1
		Australia	1
		Singapore	1
Total	6002	Total	4244

Only 1238 pts were reported to have paid for their transplants

Recommended approach to a kidney transplant candidate



Ten Years of Kidney Paired Donation at Mayo Clinic: The Benefits of Incorporating ABO/HLA Compatible Pairs

Advantages of KPD to recipients who entered KPD with an ABO/HLA compatible donor

	CMV mismatch, N = 10 (18.5%)	EBV mismatch, N = 5 (9.3%)	Age/size mismatch, N = 28 (51.9%)	Altruistic, N = 11 (20.3%)
CMV (-) recipients who gained CMV (-) donor, n (%)	9 (90)	4 (80)	4/13 (30.7)	NA
EBV (-) recipients who gained EBV (-) donor, n (%)	^b	5 (100)	1/4 (25)	NA
Age difference, median (IQR) y younger of actual donor ^a	6.5 (-1.5 to 14.25)	24 (3-29.5)	18 (13-25)	13 (-6 to 27)
P value (age)	0.10	0.12	<0.0001	0.11
ΔLKDPI difference, median LKDPI (IQR) score less than original donor	3.5 (-6.75 to 17.75)	2 (-8 to 41)	31.5 (12.3 to 47)	26 (-1 to 46)
P value (LKDPI)	0.39	0.31	<0.0001	0.01
HLA class II mismatch difference, median (IQR) ^a	-0.5 (-1.3 to 2)	1 (-2 to 1.5)	0 (-1 to 0.75)	0 (0-1)
P value (class II mismatch)	0.86	1.0	0.91	0.78
Time from original donor approval to transplant, median (IQR) days	53.5 (43.8-78.3)	61 (23.5-149.5)	54 (34-76.3)	89 (62-174)
Preemptive transplantation, n (%)	5 (50)	2 (40)	11 (39.3)	6 (54.6)
Actual donor kidney shipped from different Mayo location, n (%)	4 (40)	3 (60)	10 (35.7)	1 (9.1)

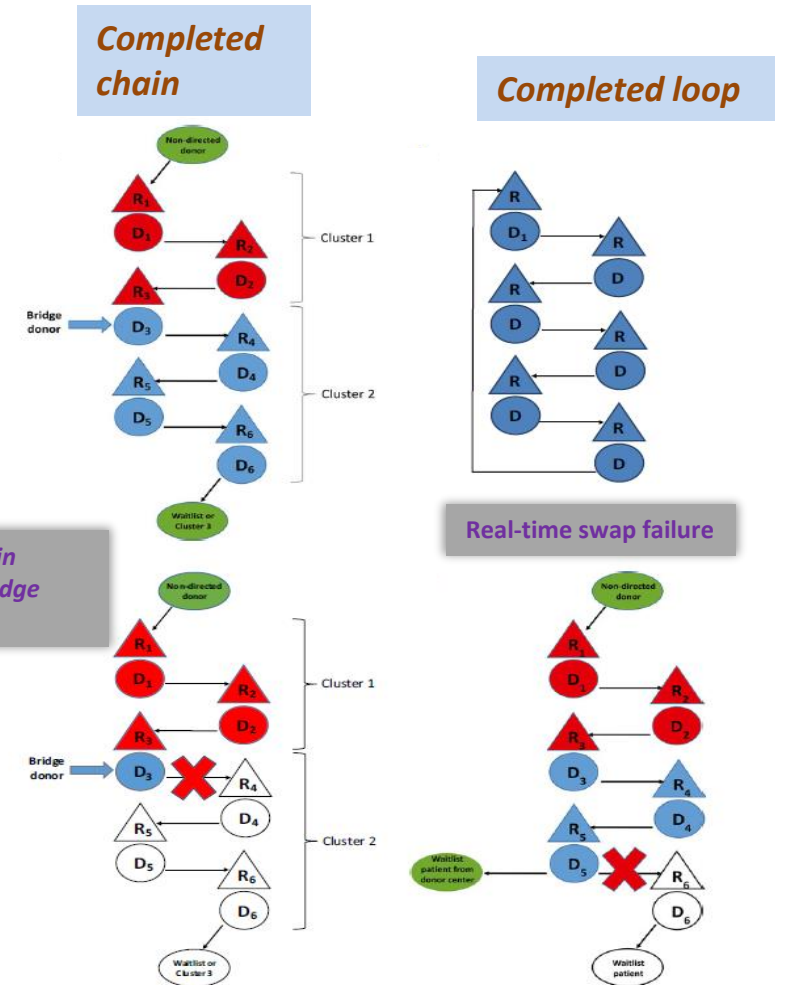
Broken Chains and Reneging: A Review of 1748 Kidney Paired Donation Transplants

All patients undergoing renal transplantation through the National Kidney Registry from 2008 – 2016 included for analysis

Chain and loop details

Category	Count	Mean length	Transplants
Active/ended	324	4.5	1472
Broken	20	4.8	96
Chain total	344	4.6	1568
Loops	78	2.3	178

- ✓ Reneging is infrequent.
- ✓ When it occurs, it is typically due to medical and logistic issues rather than intentional exploitation.
- ✓ Broken chains have no significant impact on chain length.



Patient and Kidney Allograft Survival with National Kidney Paired Donation

- ✓ 2037 consecutive KPD transplants
- ✓ between 2008 and 2017
- ✓ through the National Kidney Registry, a voluntary KPD network

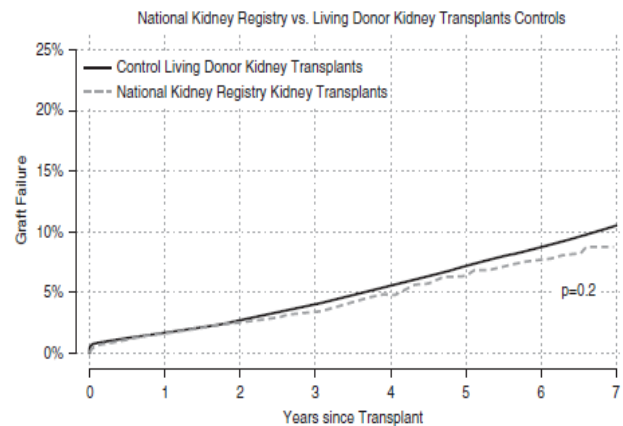
Table 4. Expected and observed number of death-censored graft failure and mortality events

Population	Graft Failure Observed	Graft Failure Expected	P Value	Mortality Observed	Mortality Expected	P Value
Living donor transplant						
National Kidney Registry kidney transplant	126	143	0.2	142	152	0.4
Control	4623	2606		5545	5535	
Unrelated living donor transplant						
National Kidney Registry kidney transplant	126	145	0.1	142	155	0.3
Control	2157	2138		2570	2557	
Kidney paired donation						
National Kidney Registry kidney transplant	126	149	0.03	142	160	0.1
Control	404	381		463	445	

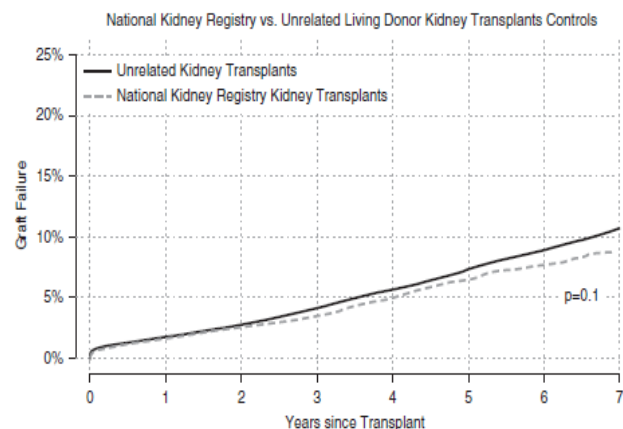
Observed and expected number of events as determined by the log-rank test of the survivor function. Recipients of National Kidney Registry-facilitated living donor kidney transplants were compared with three control groups: (1) control living donor kidney transplant recipients, (2) unrelated living donor kidney transplant recipients, and (3) recipients who participated in a kidney paired donation program that was not the National Kidney Registry.

Even after transplanting patients with greater risk factors for worse post-transplant outcomes, nationalized paired donation results in equivalent outcomes when compared with control living donor KTRs

Death-censored graft failure cumulative incidence by participation in the National Kidney Registry

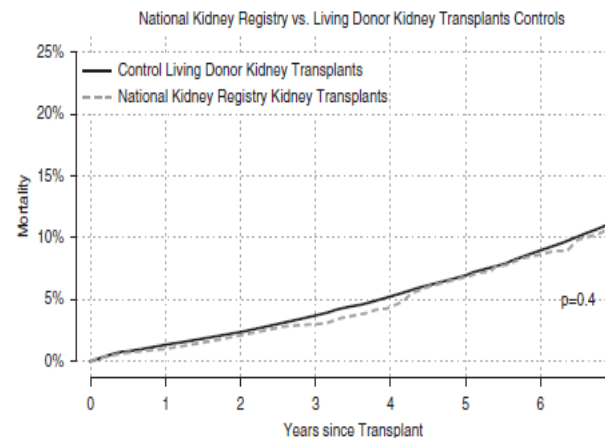


Number at risk		0	1	2	3	4	5	6	7
Control Kidney Transplants	54497	52979	46855	40770	34823	29109	23550	18274	
Paired Donation	2363	2306	1824	1433	1079	778	495	294	

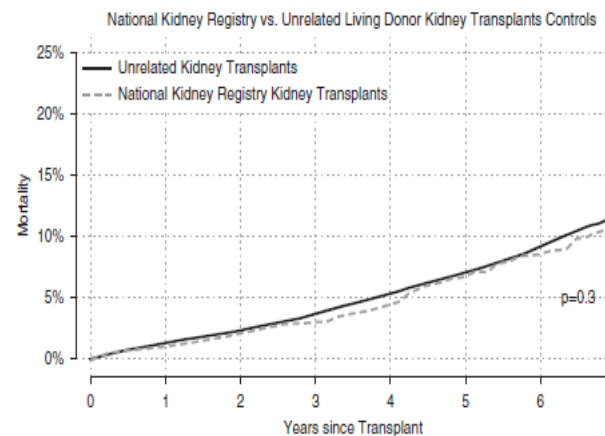


Number at risk		0	1	2	3	4	5	6	7
Control Kidney Transplants	25900	25164	21973	18794	15885	13109	10526	8023	
Paired Donation	2363	2306	1824	1433	1079	778	495	294	

Mortality cumulative incidence by participation in the National Kidney Registry



Number at risk		0	1	2	3	4	5	6	7
Control Kidney Transplants	54497	53785	48036	42339	36727	31218	25692	20334	
Paired Donation	2363	2340	1872	1492	1138	832	538	329	



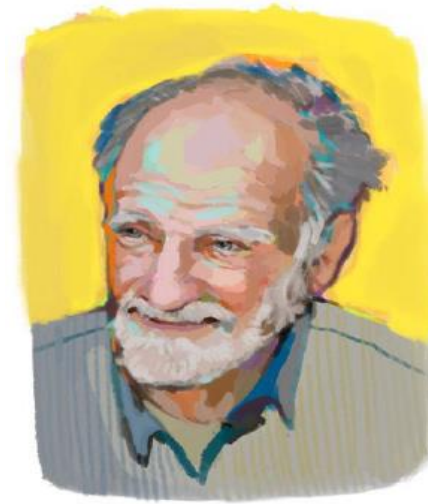
Number at risk		0	1	2	3	4	5	6	7
Control Kidney Transplants	25900	25562	22533	19531	16760	14083	11492	8937	
Paired Donation	2363	2340	1872	1492	1138	832	538	329	



How two matchmakers won a Nobel Prize in Economics in 2012

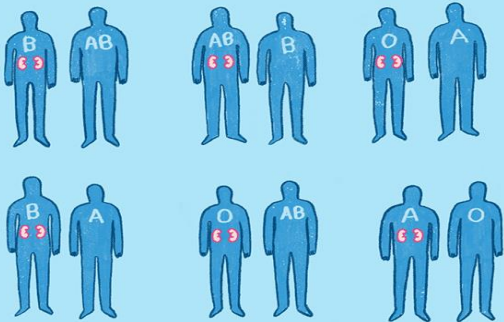


Alvin Roth
PROFESSOR, STANFORD



Lloyd Shapley
PROFESSOR EMERITUS, UCLA

Helping transplant patients find a match

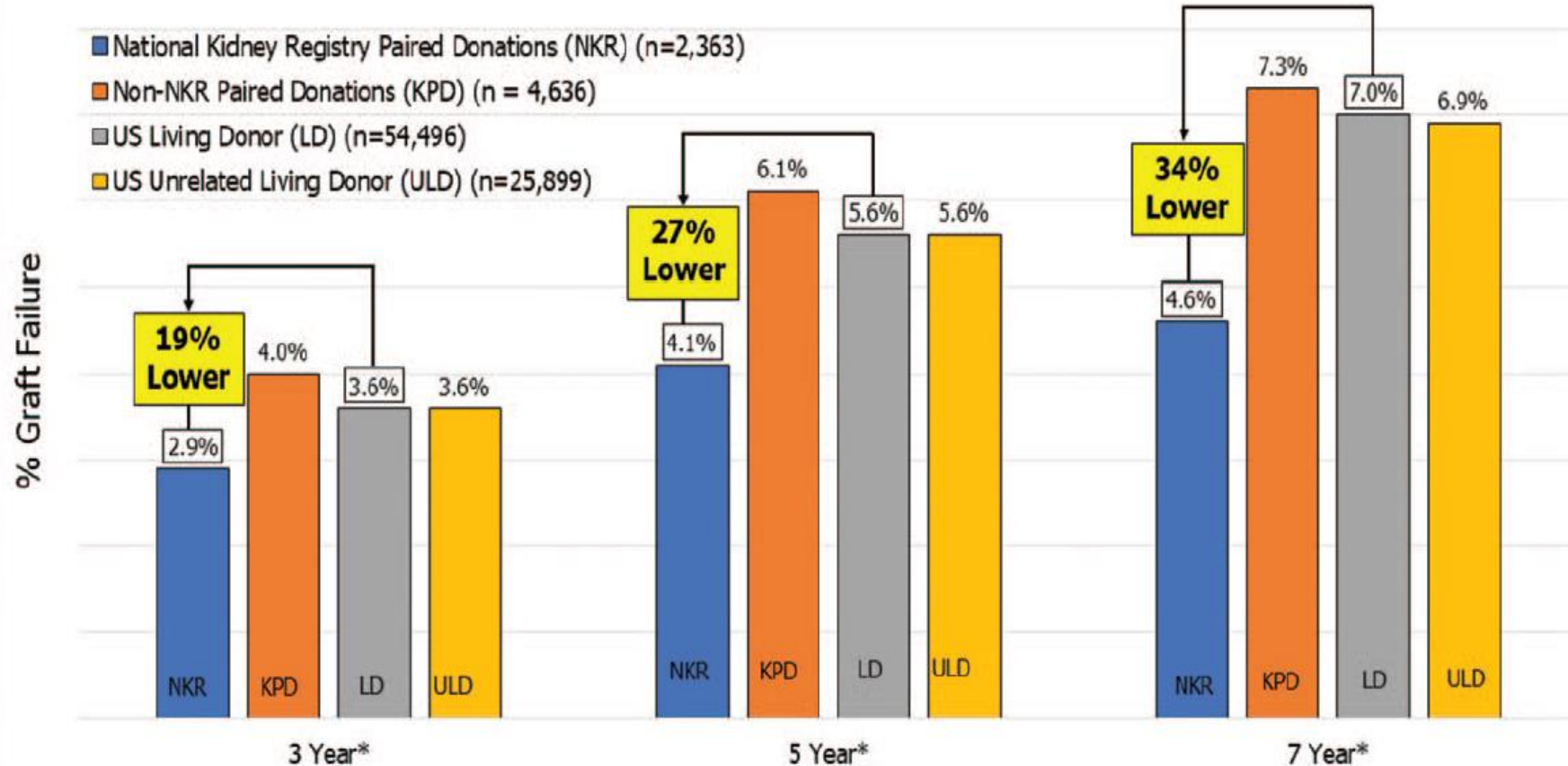


Blood types: A, B, AB and O

- ✓ Roth devised an exchange system to help incompatible donor-recipient pairs find others in the same situation.
- ✓ Through complex chains of exchange, all participants had the promise of finding a suitable match.



Innovation = Better Outcomes



*Statistically Significant

Provided courtesy of Johns Hopkins University School of Medicine, Department of Surgery *Not including CHIP patients;
Kaplan-Meier GS Rates for Transplants Performed: 02/2008-06/2017 with follow-up through 12/31/2017 https://www.srtr.org/SRTR_data_as_of_June_2018

Διασταυρούμενη μεταμόσχευση νεφρού - Περιορισμοί

- Μπορεί να μην είναι πάντα δυνατό να ταιριάζουν όλα τα ζεύγη, ειδικά σε προγράμματα με ένα κέντρο και λίγα ζεύγη
- Οι αποδέκτες της ομάδας O και οι δότες AB αθροίζονται στη λίστα
- Ο κίνδυνος να υπαναχωρήσει ο δότης αφού ο λήπτης λάβει το νεφρό από άλλο ζεύγος είναι υπαρκτός (και ιατρικοί λόγοι)
- Οι δωρητές των ΡΚΕ προγραμμάτων δέχονται μεγαλύτερη πίεση να δωρίσουν καθώς η οδός «διαφυγής» της ασυμβατότητας ως δικαιολογία δεν είναι πλέον διαθέσιμη
- Μια τάση για τα ζευγάρια να ταιριάζουν με την «ποιότητα» του νεφρού που πρόκειται να λάβουν

Διασταυρούμενη μεταμόσχευση νεφρού... Το μέλλον

- Χρήση τεχνητής νοημοσύνης
- Διαμόρφωση εθνικού και διεθνών προγραμμάτων ανταλλαγών
- Ενοποίηση πολλαπλών εθνικών μητρώων
- Χρήση συμβατών και ευαισθητοποιημένων ζευγών στη διαδικασία ανταλλαγής
- Υψηλότερο επίπεδο δεοντολογίας και συναίνεσης μαζί με μεγαλύτερη έμφαση στην εκπαίδευση των δωρητών και των ασθενών για την αύξηση της εμπιστοσύνης στο σύστημα υγειονομικής περίθαλψης
- Cryobanking διατηρημένων λεμφοκυττάρων δότη και χρήση εικονικής διασταύρωσης για να βοηθήσει στην προεπιλογή της συμβατότητας crossmatch του εξαιρετικά ευαισθητοποιημένου υποψηφίου
- Υιοθέτηση νέων τάσεων (voucher program, trans organ exchange)