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 Tweetorial Alert 

1/

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2/

Our author is Andreea @ManoleaA (nephrology resident)

Our topic: Donor and recipient diabetes in kidney transplantation

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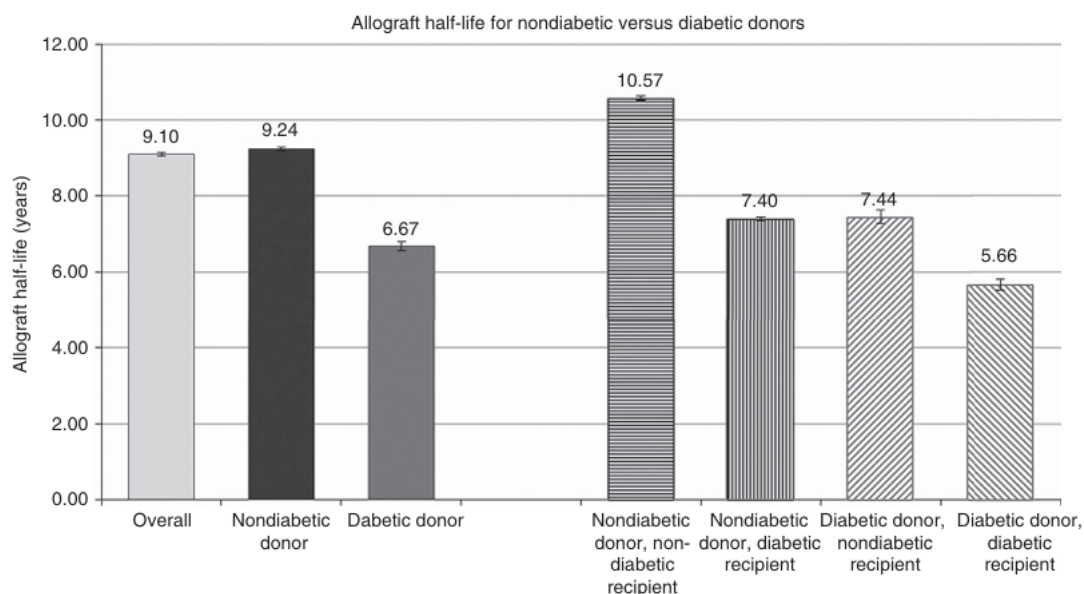
4/ Intro

- 🔴 The demand for donor kidneys continues to exceed supply
- 🔴 Kidneys from donors with diabetes are increasingly considered for transplantation
- 🔴 However, the impact of matching diabetic donors with diabetic recipients remains uncertain

5/ Intro

- 🔴 Previous studies of diabetic donor kidneys reported conflicting outcomes
- 🔴 One of the largest studies, Cohen et al. (n=161,629), a retrospective cohort, found higher mortality and graft failure, particularly in D+/R+ recipients

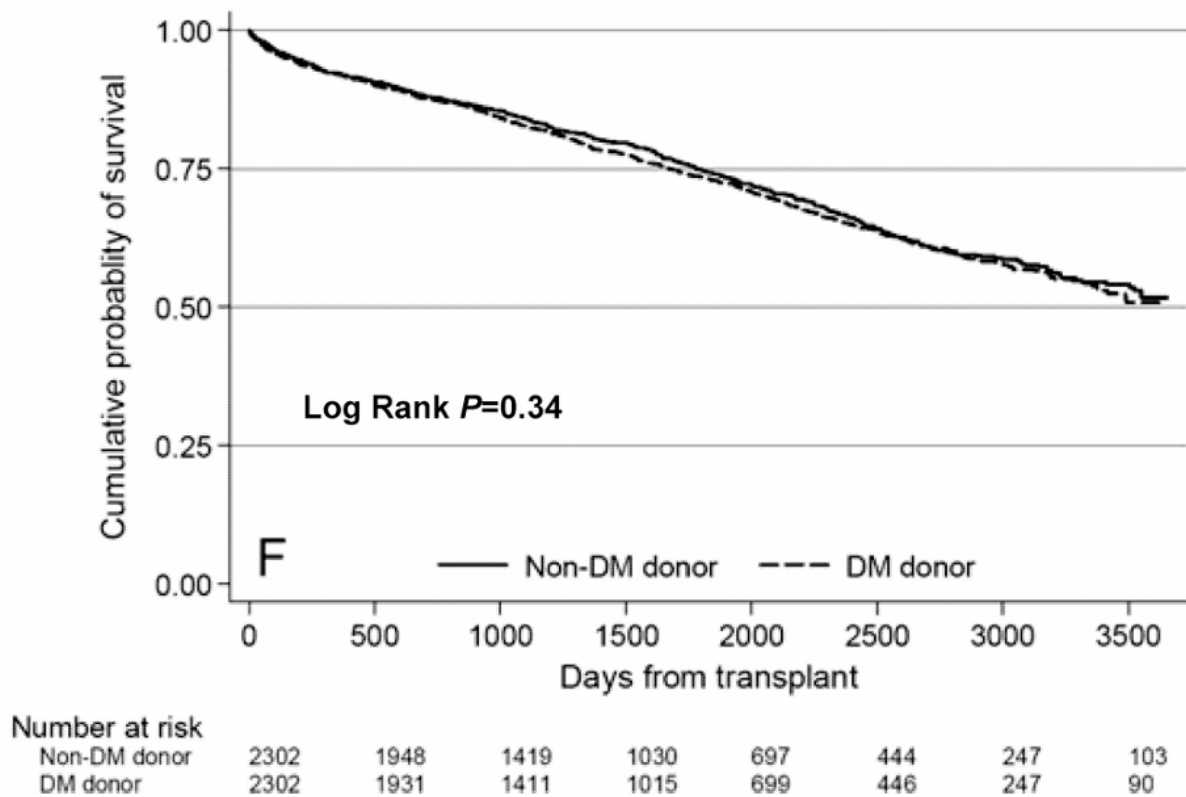
🔗 <https://pubmed.ncbi.nlm.nih.gov/26489026/>



6/ Intro

A propensity score-matched study by Ahmad et al. found no difference in mortality between recipients of diabetic and non-diabetic donor kidneys, with only a small difference in graft failure.

🔗 <https://pubmed.ncbi.nlm.nih.gov/19623022/>



7/ Why the conflicting results?

👥 Cohen: larger cohort → greater power to detect risk

⚖️ Ahmad: propensity matching → reduced baseline differences

🍷 Different donor selection & study eras may further explain the contrasting outcomes

8/ But which diabetic donors are actually used?

Not all diabetic donors carry the same risk

🩸 Donor HbA1c $\geq 6.5\%$ has been linked to lower 5-year graft survival

🔬 Diabetes severity, albuminuria & biopsy findings may refine donor risk

🔗 <https://pmc.ncbi.nlm.nih.gov/articles/PMC10101624/>

Eligibility criteria for living kidney donors with preexisting type 2 diabetes mellitus

Eligibility Criteria

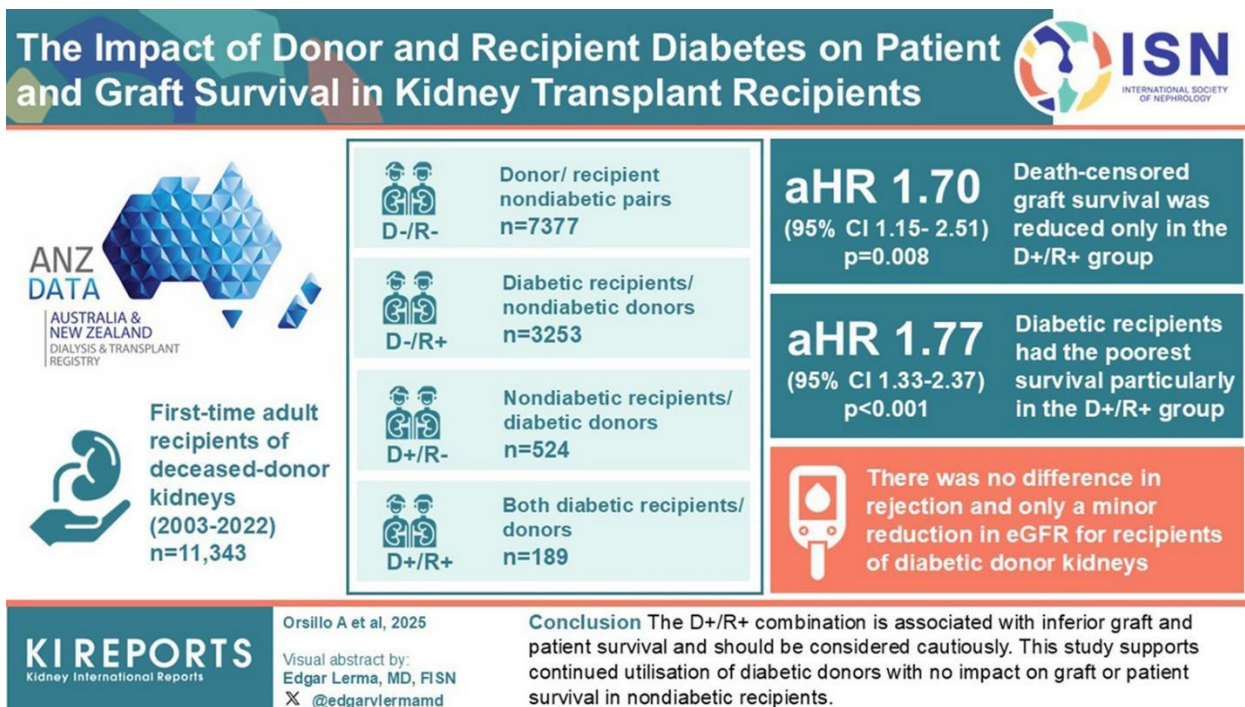
- Age >55*
- Non-insulin-dependent
- On maximum of 2 oral antidiabetic medications*
- DM duration >3 years*
- Nonsmoker
- No HTN*
- Body mass index <30 kg/m²*
- Normal fundus exam with no evidence of other end-organ/diabetic complications
- Well-controlled hyperlipidemia with recommended values as established by the American Diabetes Association guidelines as evidenced by lipid profile testing within the past year
- Urine albumin-creatinine ratio <30 mg/g or urine protein-creatinine ratio <200 mg/g
- HbA1C <7% on at least three occasions within the past 2 years

**Potential donors with slight deviations from these proposed parameters but otherwise deemed suitable by the selection committee for donation will be considered for evaluation and acceptance on a case-by-case basis.*

9/ Our [#Tweutorial](#) is based on a recent publication by Orsillo et al. and VA by @edgarvlernamd: Donor and Recipient Diabetes in KT

Examining graft and patient survival across donor–recipient diabetes combinations.

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10a/ Methods

- Data: Australia and New Zealand Dialysis and Transplant Registry (ANZDATA)
- 2003–2022
- 11,343 first-time adult recipients of deceased-donor kidney transplants
- Compared 4 donor–recipient diabetes combinations: D–/R–, D–/R+, D+/R–, D+/R+

10b/ Methods

- Inclusion: First-time adult (≥ 18 years) recipients of a deceased-donor kidney transplant
- Exclusion: Living-donor, repeat, and multi-organ transplants; missing donor or recipient diabetes status

11/ Outcomes

- Primary: Death-censored graft survival
- Secondary: Patient survival, overall graft survival, acute rejection at 12 months, and post-transplant eGFR over time

12/ Results: Clinical Characteristics

The D+/R+ group was:

-  Older
-  More often male
-  Higher BMI
-  More cardiovascular & peripheral vascular disease
-  Mostly T2DM

For diabetic donors:

-  Older and higher BMI
-  More hypertension
-  Similar terminal creatinine

Table 1. Recipient baseline characteristics

Characteristics	Both nondiabetic <i>n</i> = 7377	Diabetic recipient <i>n</i> = 3253	Diabetic donor <i>n</i> = 524	Both diabetic <i>n</i> = 189	<i>P</i> -value
Sex (%)					< 0.001
Male	4483 (60.8)	2185 (67.2)	333 (63.5)	132 (69.8)	
Age at transplant (yrs), mean (SD)	51 (13)	53 (12)	53 (12)	58 (9)	< 0.001
Missing data (%)	0 (0)	0 (0)	0 (0)	0 (0)	
BMI (kg/m ²), mean (SD)	26.7 (6.0)	28.6 (6.1)	26.7 (5.3)	29.9 (5.7)	< 0.001
Missing data (%)	85 (1.2)	53 (1.6)	12 (2.3)	6 (3.2)	
Ethnicity (%)					< 0.001
Other	6455 (91.4)	2442 (78.2)	463 (93.7)	150 (82.4)	
Aboriginal/Torres Strait Islander	232 (3.3)	290 (9.3)	18 (3.6)	19 (10.4)	
Māori	167 (2.4)	150 (4.8)	6 (1.2)	6 (3.3)	
Pasifika	206 (2.9)	241 (7.7)	7 (1.4)	7 (3.8)	
Primary cause of kidney disease (%)					< 0.001
Diabetic kidney disease	0 (0.0)	2464 (75.9)	0 (0.0)	131 (70.4)	
Glomerular disease	3375 (46.0)	354 (10.9)	246 (47.3)	24 (12.9)	
Renal vascular disease	680 (9.3)	116 (3.6)	55 (10.6)	7 (3.8)	
Hereditary kidney diseases	1566 (21.3)	86 (2.7)	105 (20.2)	6 (3.2)	
Tubulointerstitial disease	1026 (14.0)	117 (3.6)	63 (12.1)	12 (6.5)	
Other systemic disease	115 (1.6)	18 (0.6)	10 (1.9)	0 (0.0)	
Miscellaneous	573 (7.8)	90 (2.8)	41 (7.9)	6 (3.2)	
Type of diabetes mellitus (%)					< 0.001
Type 1	0 (0.0)	984 (30.2)	0 (0.0)	19 (10.1)	
Type 2	0 (0.0)	2265 (69.6)	0 (0.0)	170 (89.9)	
Comorbidities at time of transplant (%)					< 0.001
Coronary artery disease	1124 (15.2)	1129 (34.8)	103 (19.7)	75 (39.7)	
Peripheral vascular disease	401 (5.4)	920 (28.3)	41 (7.8)	54 (28.6)	
Cerebrovascular disease	361 (4.9)	316 (9.7)	28 (5.3)	19 (10.1)	
Chronic lung disease	640 (8.7)	313 (9.6)	52 (9.9)	17 (9.0)	
Total dialysis time before first transplant (months), median (IQR)	34.2 (17.8–58.0)	31.4 (16.7–51.1)	38.1 (19.9–60.7)	33.3 (18.2–51.6)	< 0.001
HLA mismatches at transplant, median (IQR)	4.0 (2.0–5.0)	4.0 (3.0–5.0)	4.0 (2.0–5.0)	4.0 (3.0–5.0)	< 0.001
Missing data (%)	30 (0.4)	6 (0.2)	1 (0.2)	0 (0)	

BMI, body mass index; HLA, human leucocyte antigen; IQR, interquartile range.

Table 2. Donor characteristics

Characteristics	Both non-diabetic <i>n</i> = 7377	Diabetic recipient <i>n</i> = 3253	Diabetic donor <i>n</i> = 524	Both diabetic <i>n</i> = 189	<i>P</i> -value
BMI (kg/m ²), mean (SD)	26.9 (6.1)	26.5 (5.9)	30.0 (6.4)	31.2 (7.5)	< 0.001
Missing data (%)	16 (0.2)	5 (0.2)	0 (0)	0 (0)	
Age (yrs), median (IQR)	48 (33–59)	44 (28–57)	55 (48–62)	56 (46–64)	< 0.001
Missing data (%)	0 (0)	0 (0)	0 (0)	0 (0)	
Sex (%)					0.15
Male	4166 (56.5)	1827 (56.2)	319 (60.9%)	114 (60.3%)	
Cause of death (%)					< 0.001
Intracranial hemorrhage	3026 (42.7)	1257 (40.2)	191 (38.4)	61 (33.3)	
Traumatic brain injury	1420 (20.0)	680 (21.7)	61 (12.3)	21 (11.5)	
Cerebral infarct	410 (5.8)	154 (4.9)	47 (9.5)	20 (10.9)	
Cerebral hypoxia / ischemia	1865 (26.3)	897 (28.7)	185 (37.2)	72 (39.3)	
Other neurological condition	68 (1.0)	42 (1.3)	6 (1.2)	4 (2.2)	
Nonneurological condition	295 (4.2)	99 (3.2)	7 (1.4)	5 (2.7)	
Donation after brain death	5801 (78.6)	2650 (81.5)	417 (79.6)	141 (74.6)	0.003
Hypertension (%)					< 0.001
No	5716 (77.5)	2613 (80.3)	231 (44.1)	82 (43.4)	
Unknown	66 (0.9)	28 (0.9)	10 (1.9)	2 (1.1)	
Yes	1595 (21.6)	612 (18.8)	283 (54.0)	105 (55.6)	
Smoking history (%)					< 0.001
Never	2837 (38.5)	1276 (39.2)	178 (34.0)	57 (30.2)	
Current or former	4516 (61.2)	1964 (60.4)	343 (65.5)	131 (69.3)	
Not reported	24 (0.3)	13 (0.4)	3 (0.6)	1 (0.5)	
Terminal creatinine, μ mol/l, median (IQR)	71.0 (57.0–96.0)	70.0 (56.0–91.0)	76.0 (60.0–102.5)	74.0 (59.0–103.0)	< 0.001
Total ischemic time, h, mean (SD)	11.6 (4.7)	11.3 (4.8)	11.7 (4.8)	11.5 (5.4)	0.018
Missing data (%)	197 (2.7)	111 (3.4)	14 (2.7)	6 (3.2)	
Single or dual kidney to single recipient (%)					< 0.001
Single	7219 (97.9)	3204 (98.5)	498 (95.0)	178 (94.2)	
Dual	158 (2.1)	49 (1.5)	26 (5.0)	11 (5.8)	
Dual kidney donor aged < 18 yrs (%)	51 (8)	14 (4.7)	0 (0)	0 (0)	0.16

BMI, body mass index; IQR, interquartile range.

13/ Results: Cohort & Follow-up

-  11,343 kidney transplant recipients included
-  Median follow-up: 6.16 years
-  3,427 graft losses and 2,532 deaths
-  Only 124 patients were lost to follow-up

14a/ Results: Patient Survival

-  Death-censored graft survival was similar for most donor–recipient combinations
-  D+/R+ had significantly worse patient survival
-  aHR 1.70 (95% CI 1.15–2.51)
-  D–/R+ had reduced patient survival
-  aHR 1.38 (95% CI 1.18–1.61)

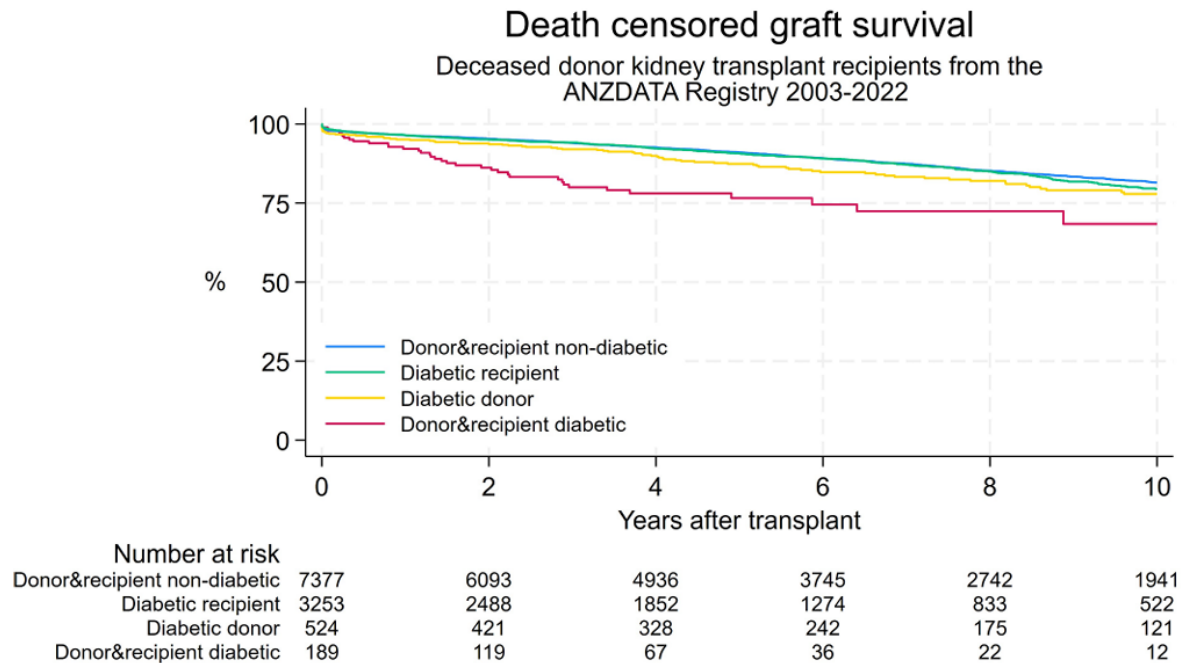


Figure 1. Kaplan Meier Survival curves for death censored graft survival for deceased donor kidney transplant recipients from the ANZDATA Registry 2003–2022. ANZDATA, Australia and New Zealand Dialysis and Transplant.

14b/ Results: Graft Survival

 Diabetic recipients had reduced overall graft survival

 D+/R+: aHR 1.52 (95% CI 1.16–1.98)

 D–/R+: aHR 1.19 (95% CI 1.03–1.36)

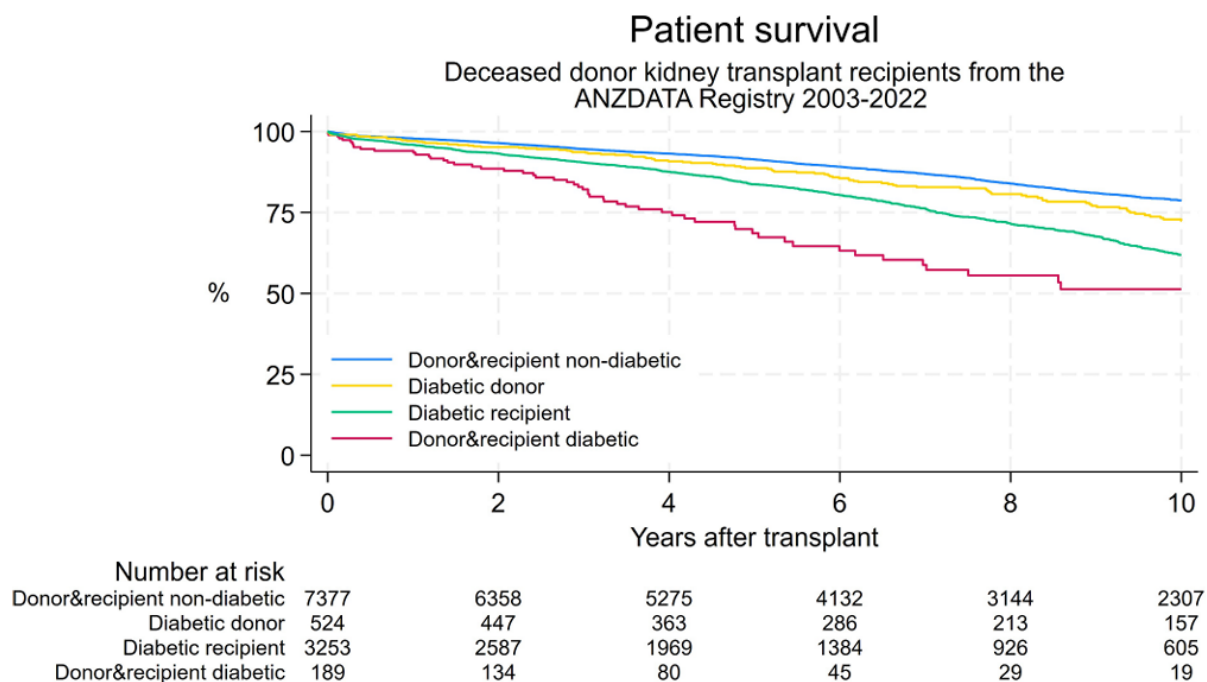
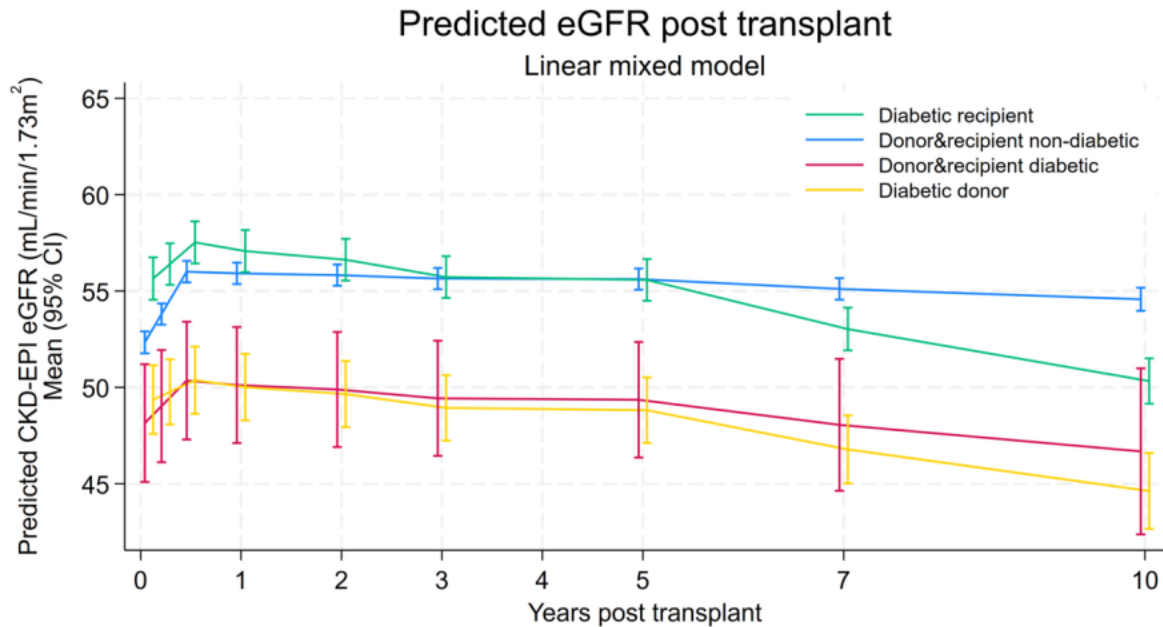


Figure 2. Kaplan Meier Survival curves for patient survival for deceased donor kidney transplant recipients from the ANZDATA Registry 2003–2022. ANZDATA, Australia and New Zealand Dialysis and Transplant.

15/ Results: Outcomes

- ⚙️ No significant difference in rejection between groups
- ⚙️ Diabetic donor kidneys were associated with only a minor reduction in eGFR
- 📈 The difference was small during the first 5 years post-transplant
- 📈 D-/R- recipients had the best eGFR over time



16/ Summary

- ⚡ Donor diabetes alone did not worsen graft or patient survival
- ⚡ D+/R+ had the poorest graft and patient survival
- ⚡ eGFR was only slightly lower, with no difference in rejection

17/ Limitations

- 👎 Observational registry study, with potential residual confounding
- 👎 Relatively small D+/R+ group (n=189)
- 👎 No data on diabetes severity, duration, treatment or HbA1c
- 👎 Lack of kidney biopsy data to assess diabetic kidney changes

18/ Based on this evidence, does this change your perspective on using kidneys from donors with diabetes for transplantation? Please comment!

19/ We hope this [#tweetorial](#) improved your understanding of donor & recipient diabetes in KT. Please share! Thanks to [@ManoleaA](#) for authoring & for great feedback! [@ISNkidneycare](#)

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