

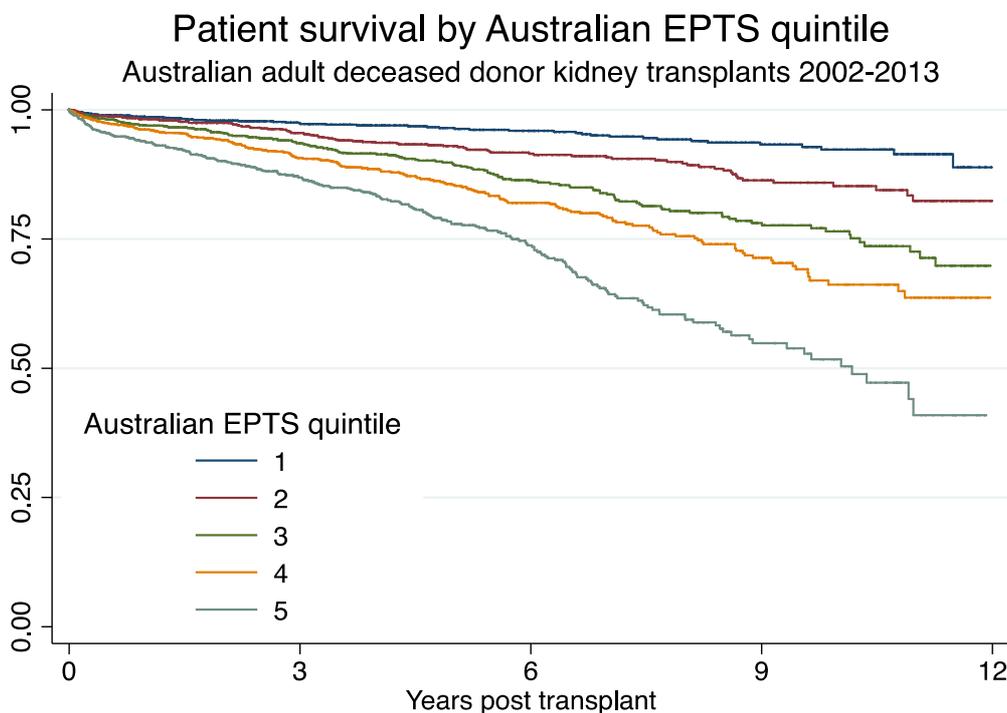
## A Guide to the Australian Estimated Post-Transplant Survival (EPTS) Score

### What is the EPTS?

The US Estimated Post Transplant Survival (US EPTS) Score was developed by the United Network for Organ Sharing (UNOS) in the USA. It is a score that combines four clinical parameters (age, time on dialysis, prior solid organ transplant and diabetes) to estimate the post-transplant survival of kidney transplant recipients. It is used in the US kidney allocation system to prioritise the allocation of kidneys with a favourable prognosis to recipients with a favourable prognosis. The US EPTS has been validated in the Australia/New Zealand deceased donor kidney transplant population using ANZDATA, with an unadjusted c-statistic of 0.67 that improved to 0.69 after adjusting for donor and transplant factors (1).

### What is the Australian EPTS?

This is very similar to the UNOS EPTS, except that it omits diabetes as a parameter (because diabetes is not captured in NOMS presently). The Australian EPTS was developed by re-fitting the US EPTS, without diabetes, to the Australian/NZ deceased donor transplant population over 2002-2013. In this population the c-statistics were 0.65 and 0.67 before and after adjusting for donor and transplant factors respectively. When applied to more recent transplants (2014-2016) the c-statistics were 0.67 and 0.69 respectively.



### How does the Australian EPTS scoring system work?

A raw EPTS score is calculated using the following formula:

$$\begin{aligned} \text{Raw EPTS} = & \\ & 0.049 \times \max(\text{age} - 25, 0) + \\ & 0.493 \times \text{prior kidney transplant} + \\ & 0.287 \times \log(\text{years on dialysis} + 1) + \\ & 0.598 \times (\text{years on dialysis} = 0) \end{aligned}$$

The raw EPTS score is then converted into an EPTS percentile (range 1% to 100%) by comparing it with the distribution of raw EPTS scores in patients on the Australian kidney waiting list at the end of the previous year.

An EPTS of 1% is at the best end of the spectrum

An EPTS of 100% is at the worst end of the spectrum

An EPTS of 50% is the median score (equivalent to an “average” patient on the waiting list)

A score of 20% indicates that the recipient has a relative risk of mortality that is worse than only 20% of other patients on the waiting list (i.e. better than 80% of other patients).

A score of 90% indicates that the recipient has a relative risk of mortality that is worse than 90% of other patients on the waiting list (i.e. better than only 10% of other patients).

**The EPTS can be calculated manually using the EPTS calculator available on the TSANZ website.**

### Is the EPTS used in the kidney allocation system?

No, the EPTS is not currently used in the Australian kidney allocation system. It is being reported at the time of kidney allocation to assist clinicians in considering whether the kidney being offered is a good “prognosis match” for that recipient. It is likely that the Australian EPTS will be used to direct kidney allocation in the future.

### What is the relationship between the EPTS and the KDRI?

The EPTS is a score to estimate a patient’s survival after deceased donor kidney transplantation, and the KDRI is a score to estimate the graft survival. Thus, the EPTS is concerned with the recipient’s prognosis and only includes recipient parameters, whereas the KDRI is concerned with the kidney’s prognosis and only includes donor parameters. Both scores were developed in the US and have been validated in the Australian/New Zealand population.

### How should the EPTS score be used when considering a kidney offer?

The EPTS score enables the clinician to understand where the patient sits on the waiting list in terms of their post-transplant survival prognosis in relation to other patients. This may be helpful when considering an offer of a kidney with a relatively high KDRI (high-risk, poor prognosis or “marginal” kidney).

### What are the limitations of the EPTS?

No risk score is perfect. The c-statistics of the EPTS indicate that, given any two patients, it will only correctly identify the patient who lives longer around two-thirds of the time. The Australian EPTS does not include diabetic status, in addition to a number of other strong risk

factors for post-transplant mortality such as peripheral vascular disease and ethnicity. However, it does include patient age which is by far the strongest predictor of post-transplant survival.

**Other considerations**

It is important to bear in mind that neither the KDRI nor the EPTS include all clinically important predictors of prognosis. Furthermore, these scores do not include any information on the quality of the immune match, likelihood of and expected waiting time for a future better kidney offer, estimated ischaemic time etc that should be considered when weighing up whether or not to proceed with any given donor kidney offer.

**Contact for queries or questions.** Please email:

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**References**

1. Clayton PA, McDonald SP, Snyder JJ, Salkowski N, Chadban SJ. External validation of the estimated posttransplant survival score for allocation of deceased donor kidneys in the United States. *Am J Transplant.* 2014 Aug;14(8):1922–6.