SRTR

SCIENTIFIC REGISTRY OF TRANSPLANT RECIPIENTS

The Potential Survival Benefit of DCD Livers

Andrew Wey, PhD

SRTR Collaborators

Nicholas Salkowski, PhD
Jack Lake, MD (University of Minnesota)
Ray Kim, MD (Stanford University)
Bertram Kasiske, MD
Ajay Israni, MD, MS (Hennepin Healthcare, University of Minnesota)
Jon Snyder, PhD

Disclosures

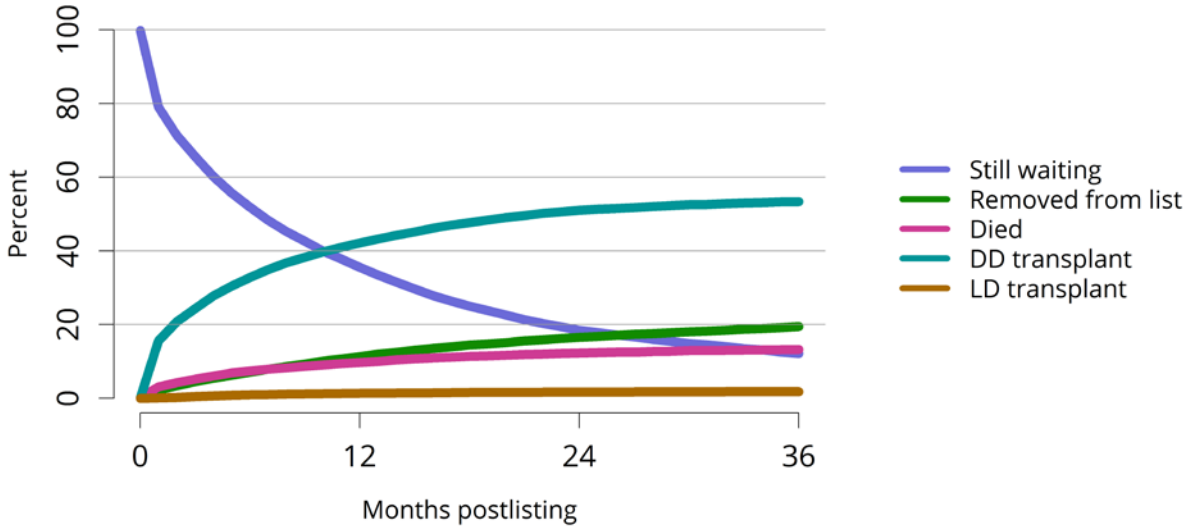
Andrew Wey, PhD
Biostatistician
Minneapolis Medical Research Foundation
Minneapolis, MN, United States

I have no financial relationships to disclose within the past 12 months relevant to my presentation. The ACCME defines “relevant” financial relationships as financial relationships in any amount occurring within the past 12 months that create a conflict of interest.

This work was supported wholly or in part by HRSA contract HHSH-250-2015-00009C. The content is the responsibility of the authors alone and does not necessarily reflect the views or policies of the Department of HHS, nor does mention of trade names, commercial products, or organizations imply endorsement by the U.S. Government.

Waiting List Outcomes

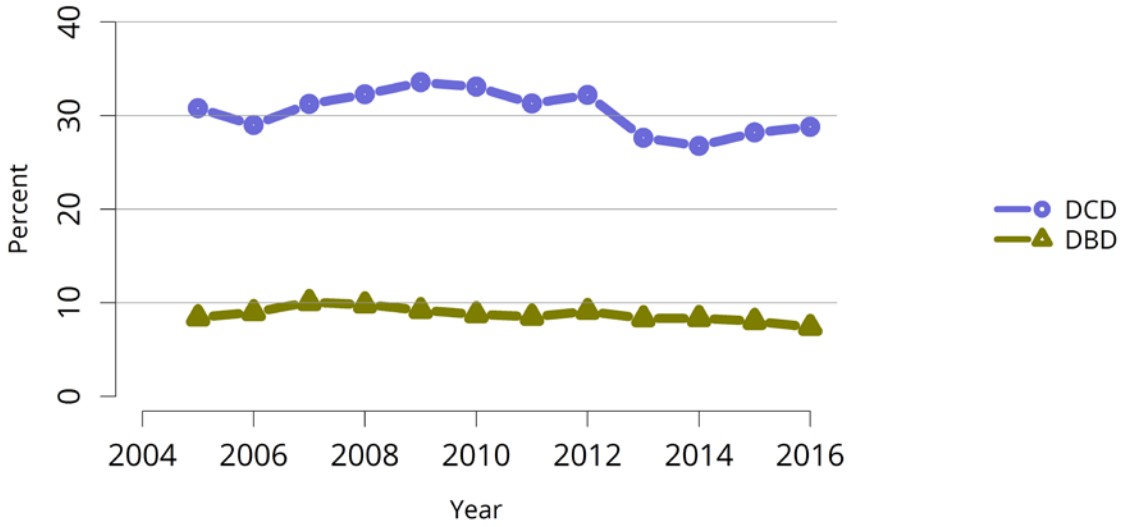
Figure LI 10. Three-year outcomes for adults waiting for liver transplant, new listings in 2013



OPTN/SRTR 2016 Annual Data Report

Discarded DCD Livers

Figure LI 26. Rates of livers recovered for transplant and not transplanted by DCD status



OPTN/SRTR 2016 Annual Data Report

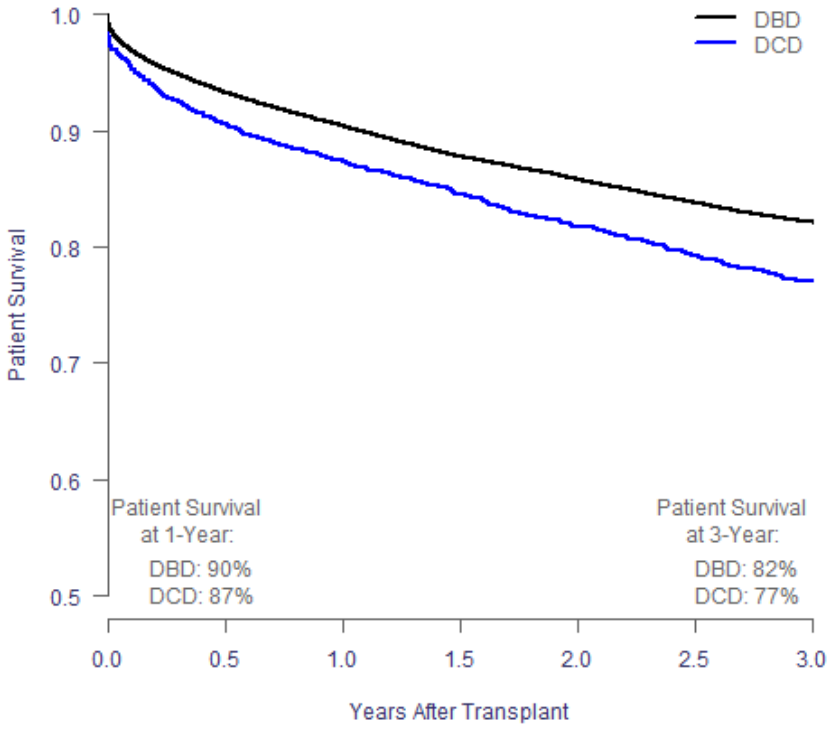
The Relationship between Offer Acceptance and Donor Quality

Absolute survival and survival benefit are two frameworks for offer acceptance decisions (Feng. The dilemma of high-risk deceased donor livers: who should get them? *Liver Transplantation*, 2010).

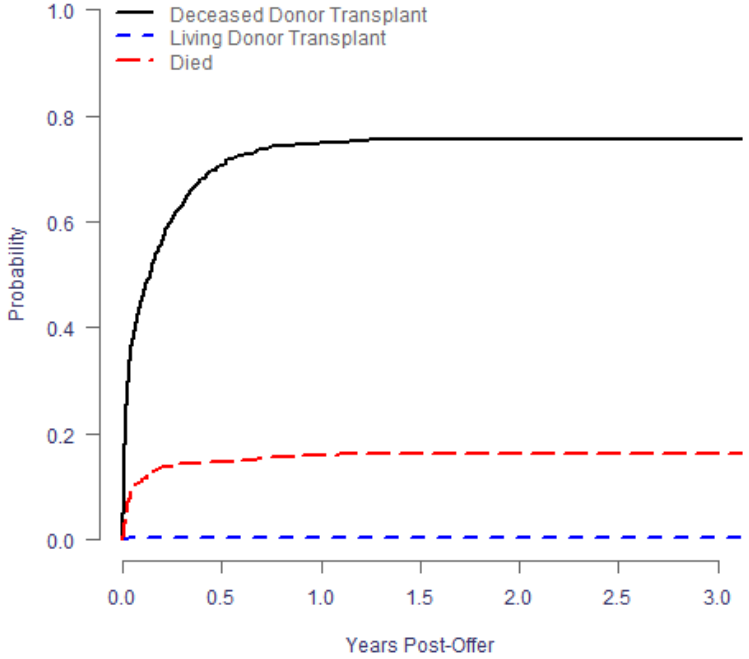
Survival benefit aims to maximize a candidate's survival from the time of offer. Survival benefit depends on:

- If an offer is accepted: Expected posttransplant survival with the offered liver.
- If an offer is declined:
    - Expected probability of subsequently undergoing transplant.
    - Candidate's expected waitlist mortality.

Patient Survival after Transplant of DBD versus DCD Livers



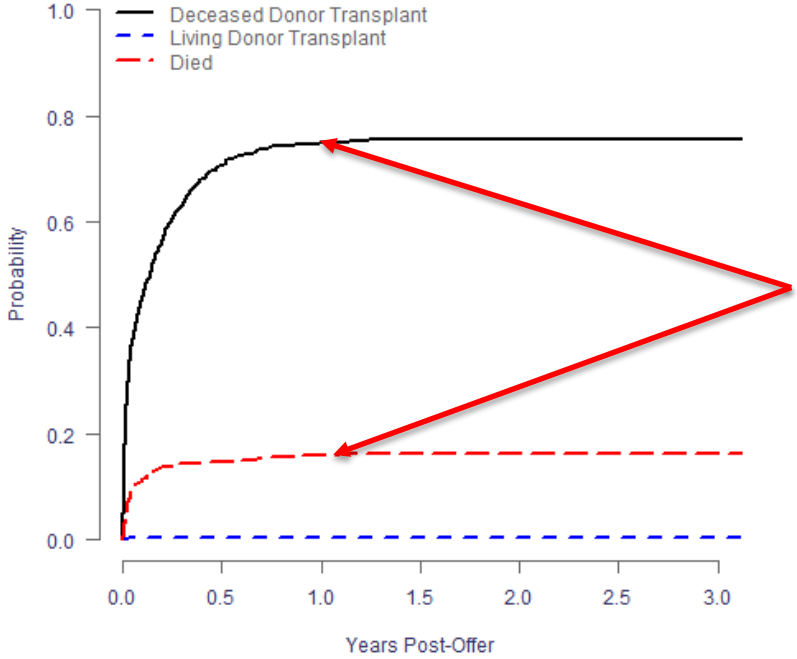
Candidate Outcomes after Declining DCD Offer: MELD ≥ 30



Probability of Deceased Donor Transplant by 1 Year: 68%.

Probability of Dying on Waiting List by 1 Year: 14%.

Candidate Outcomes after Declining DCD Offer: MELD ≥ 30

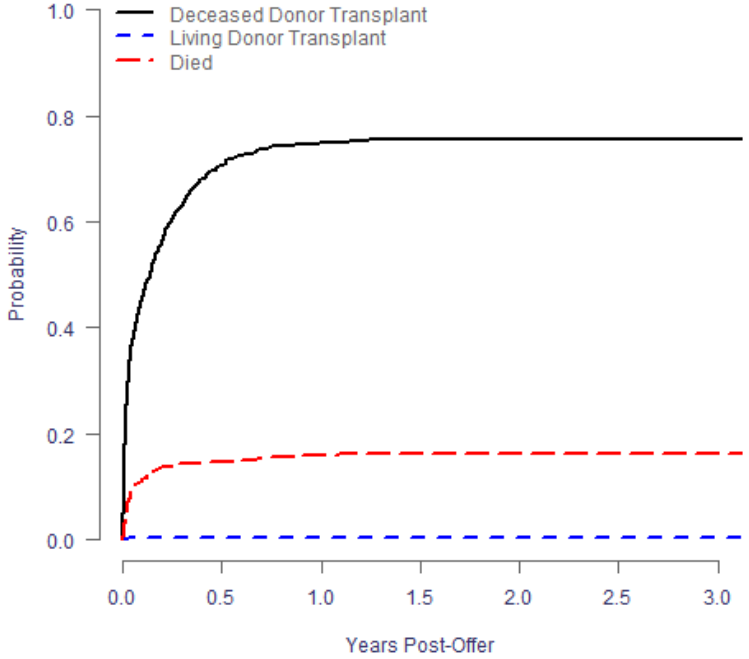


Probability of Deceased Donor Transplant by 1 Year: 68%.

After declining a DCD offer, patients can die on the waiting list or after a subsequent transplant.

Probability of Dying on Waiting List by 1 Year: 14%.

Candidate Outcomes after Declining DCD Offer: MELD ≥ 30

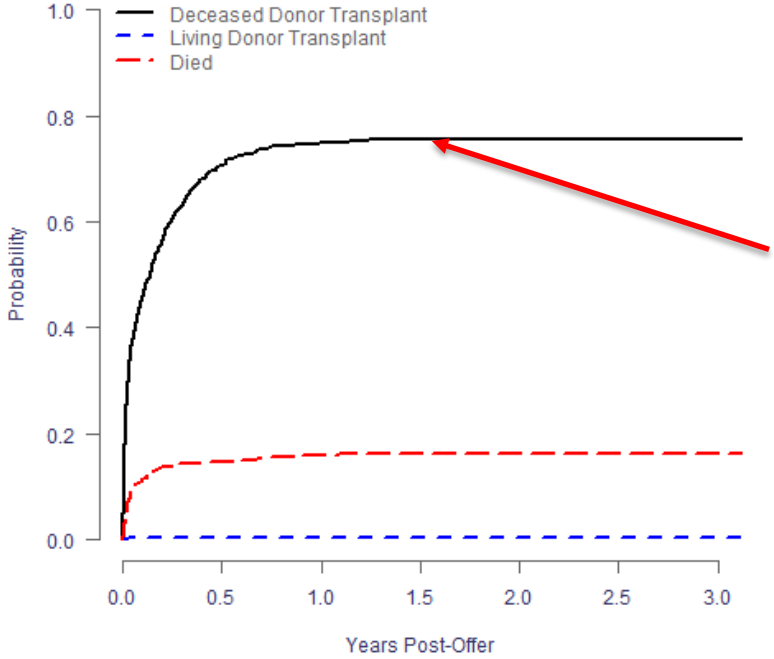


Probability of Deceased Donor Transplant by 1 Year: 68%.

Without considering mortality from subsequent transplants, DCD livers have a survival benefit at 1 year: 13% versus 14%.

Probability of Dying on Waiting List by 1 Year: 14%.

Candidate Outcomes after Declining DCD Offer: MELD ≥ 30



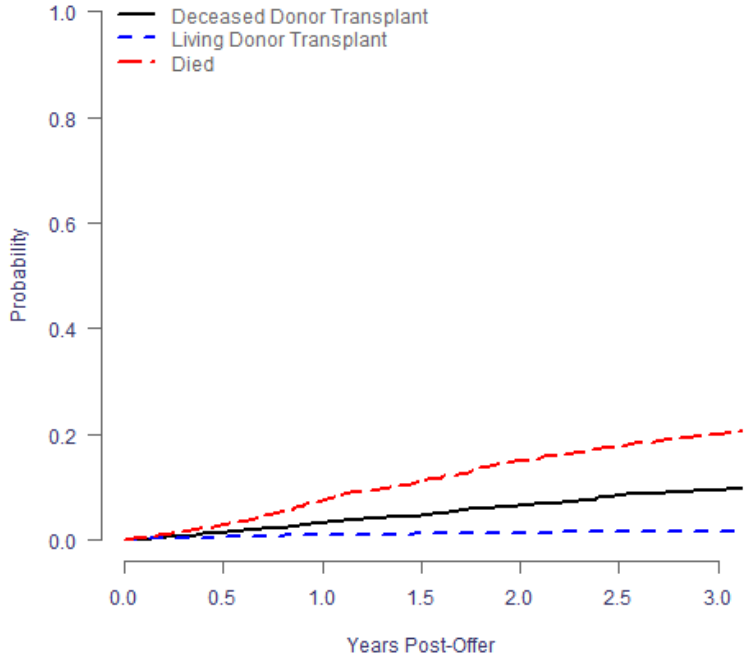
Probability of Deceased Donor Transplant by 3 Years: 71%.

If 90% of these recipients are alive 3 years after the DCD offer, then DCD livers still have a survival benefit at 3 years:

71% x 10% + 17% ≈ 24% versus 23%.

Probability of Dying on Waiting List by 3 Years: 17%.

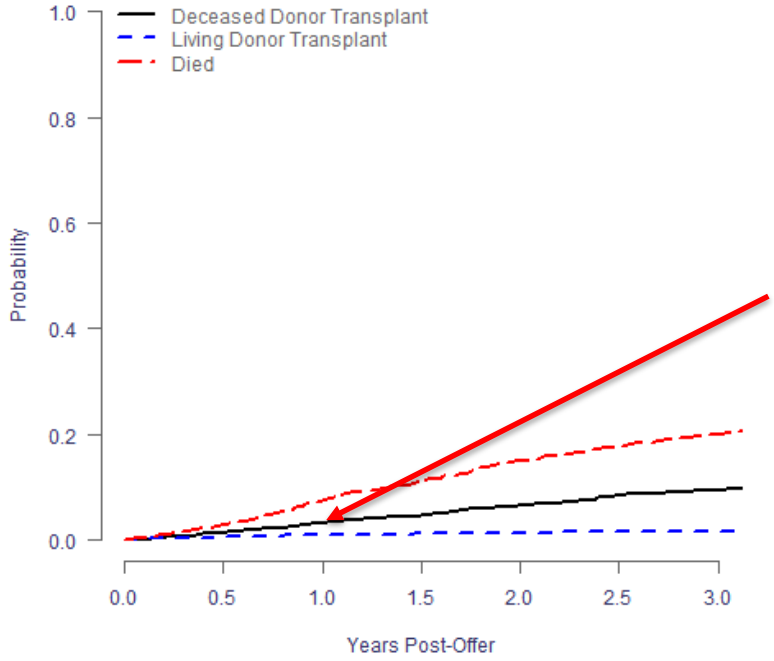
Candidate Outcomes after Declining DCD Offer: MELD < 15



Probability of Deceased Donor Transplant by 1 Year: 3%.

Probability of Dying on Waiting List by 1 Year: 7%.

Candidate Outcomes after Declining DCD Offer: MELD < 15



Probability of Deceased Donor Transplant by 1 Year: 3%.

If only 90% of these recipients are alive 1 year after the DCD offer, then DCD livers do not have a survival benefit at 1 year:

3% x 10% + 7% ≈ 10% versus 13%.

Probability of Dying on Waiting List by 1-Year: 7%.

Survival Benefit of DCD Livers

These heuristic calculations suggest that DCD livers may provide more of a survival benefit to higher-MELD candidates than to lower-MELD candidates.

However, the calculations need to account for more details because:

1. The experience of candidates after declining a DCD liver will differ based on allocation priority, MELD, and the relative donor supply and demand in the donation service area.
2. Donor quality of subsequent transplants may depend on relative allocation priority.
3. The offered organ and given candidate will have additional comorbidity that may change the estimated survival benefit.

Liver Offer Acceptance Decision Tool

Use match run data to identify similar candidates who declined an offer based on:

1. Offer number (point in the match run)
2. Age
3. Height
4. Diagnosis
5. Exemption status
6. Allocation MELD
7. DSAs with similar transplant rates

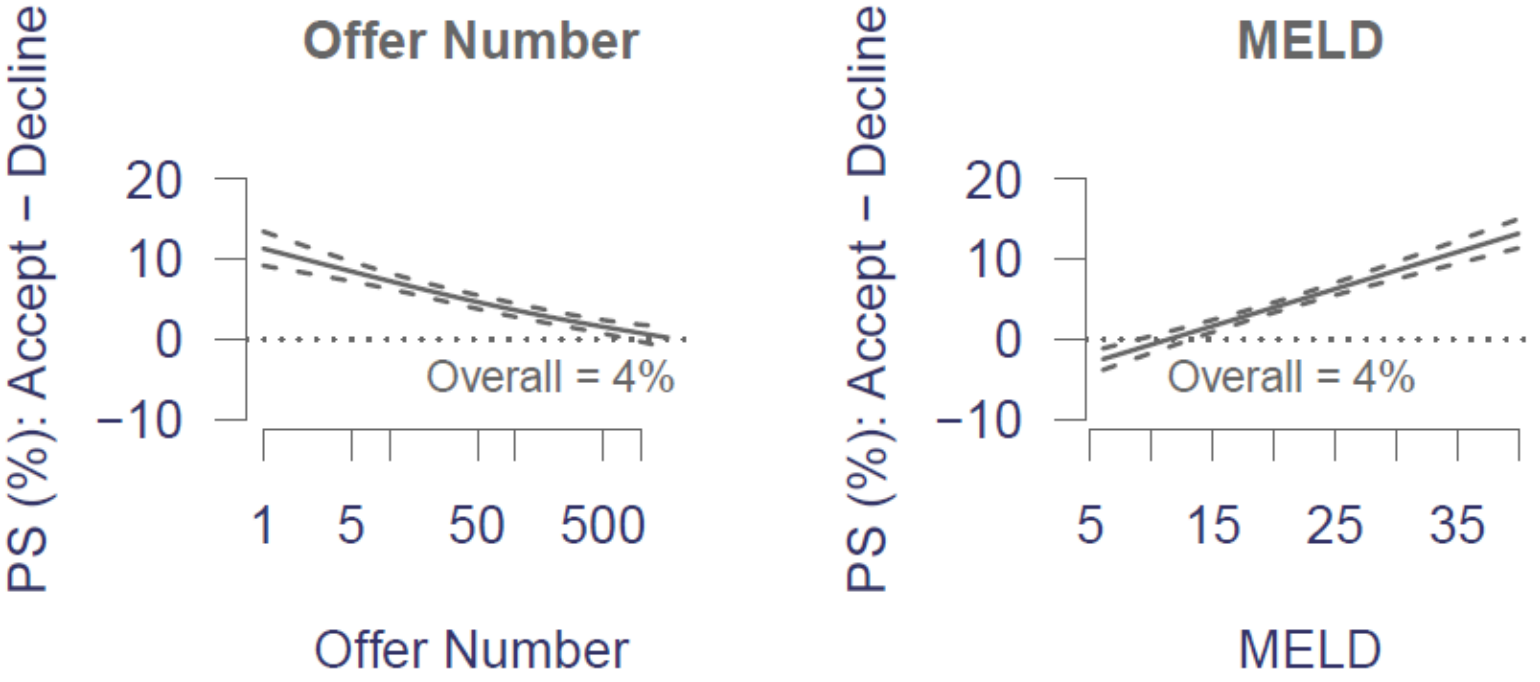
Estimate the potential waitlist outcomes after declining an offer with these similar candidates.

Liver Offer Acceptance Decision Tool

Relatively simple posttransplant survival models estimated the outcomes of deceased donor offers.

The potential survival benefit of DCD donors was estimated with declined offers from DCD donors recovered between January 1, 2013, and December 31, 2013.

Survival Benefit of DCD Livers: 1 Year



Conclusion

Acceptance of DCD offers was predicted to confer, on average, a 3% survival benefit after 1 year compared with declining the offer, although the benefit strongly depended on MELD score.

Declining a DCD donor offer *and* restricting the donor pool to DBD donors did not improve the probability of patient survival.

DCD donors represent an opportunity to expand the donor pool that may confer a survival benefit for candidates.

References

Qualitatively similar results to…

Schaubel et al. The survival benefit of deceased donor liver transplantation as a function of candidate disease severity and donor quality. *American Journal of Transplantation*, 2008.

Croome et al. What are the outcomes of declining a Public Health Service increased risk liver donor for patients on the liver transplant waiting list? *Liver Transplantation,* 2018.

References

Characterizing the survival and complications of DCD transplants…

Kollman et al. Expanding the donor pool: Donation after circulatory death and living liver donation does not compromise the results of liver transplantation. *Liver Transplantation.* In press.

Croome et al. Outcomes of donation after cardiac death liver grafts from donors ≥ 50 years of age: A multi-center analysis. *Transplantation.* In press.