Transplant sick patients and maintain outcomes

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Can we transplant sicker patients while….

- Maintaining excellent outcomes
- Remaining good stewards for the organs
- Avoiding futile transplants

Yes, we can!

- Instituting consistent and targeted outcome monitoring
  - Using both risk adjusted and non risk adjusted outcomes and metrics
  - Identify centers who are risk adverse and those who have excessive risk taking behavior

Results of Geographic Inequity [1]

Boundaries for local and regional allocation not based on population, need, or organ availability

- LARGE variability in MELD at transplant
- LARGE variability in transplant rates
- Three fold difference in mortality by DSA
- Two fold differences in mortality by Region
- Dictates candidate behavior
  - Increase in living donor transplants
  - Increase in dual listing

- 1 Yeh et al. Transplantation 2011

DSAs quartiled by MELD at txp

	Quartile 1	Quartile 2	Quartile 3	Quartile 4
MELD at TXP	22.2	23.4	24.4	28.0
Life support at time of txp (%)	2.3	2.1	3.1	6.3
Txp center/DSA	2.2	2.4	3.1	5.4
Conversion rate	55.2	54.0	48.5	53.7
Txp rate (%/pt mo)	4.8	3.1	1.6	1.0
Txp at MELD <15	10	3.6	8.2	3.9
Living donor txp (%)	0.4	0.8	3.9	8.6
Dual listing	0.27	0.35	1.10	0.98
Length of stay	14.3	15.3	18.5	16.9

Predictors of post transplant outcome

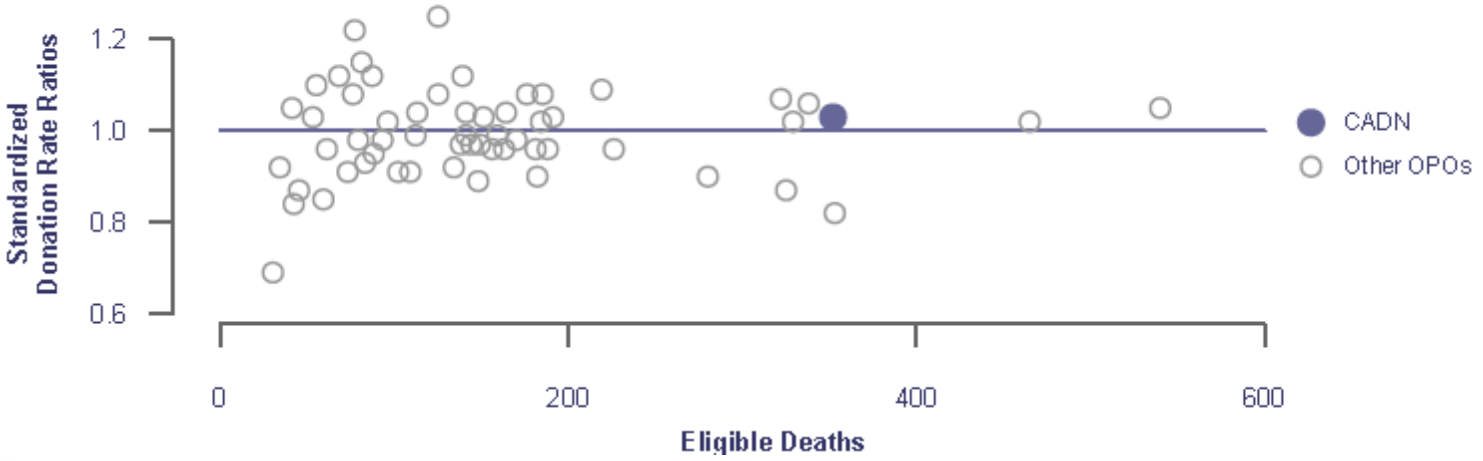
- Preoperative MELD score – much better predictor of waitlist mortality BUT
  - is relatively poor predictor of post transplant survival
  - C-statistic, ROC AUC = 0.54-0.61
- Other scores might be more accurate – e.g. SOFT score etc
- Combining recipient AND donor characteristics
  - Previous transplant
  - Life support pre-transplant
- Question – SHOULD the allocation system try to better match recipients and donors for maximum benefit?

Region 5

DSA/OPO	Median MELD Pre/Post
AZOB	28/29
CADN	33/34
CAOP	34.5/37
CASD	31/36
UTOP	33/34

CADN

- Population of DSA; 13 million (ranks 3rd among DSAs)
- Death rate within DSA 6.1 per 1000 (51st among DSAs)



- Liver organ specific donation rates per 100 eligible deaths
- Oberved 63.4, Expected 61.1, Donation rate ratio: 1.04
- Median MELD at Transplant: 33 Pre/34 post

Region 5 – CTDN MELD scores

	US %	Region 5	CAPM	CASF	CASU
Status 1A	4.5	6.8	13.4	7.5	6.0
31-40	24	35.8	29.9	32.3	36
21-30	22.6	14.1	14.9	9.8	12
15-20	16.8	10.0	11.9	15	4.0
11-14	11.7	10.3	4.5	12.8	18.0
6-10	14.8	15.9	25.4	18.8	24.0

CADN – three liver transplant centers

Center	Volume	1 yr pt/graft	3 yr pt/graft
CAPM	67	99.37*/96.61*	85.19*/84.67*
CASF	133	92.20/89.82	85.97*/84.67
CASU	50	92.28/91.03	85.09/80.99
US	-	90.58/87.96	80.79/77.31

Quality metrics and risk adjustment

- Risk adjustment – important to understand observed outcomes and relationship to expected outcomes based on recipient and donor characteristics
- Is there such a thing as 'too much' risk adjustment? Based on just O/E ratios?
  - Encourage risk taking – with donors and recipients
  - Promote more futile transplants, (e.g. dead people)
  - Promotes risk taking behavior
- In an environment of scare resources, should we at least set a floor for non-risk adjusted outcomes?
  - Absolute standards for patient, graft survival
  - May promote risk averse behavior
  - Cherry picking
  - Competition for recips and donor organs are the counter force
  - Altering the reimbursement paradigm to reward centers that successfully take on the highest risk recipients, and to care for sick pts with ESLD

How to attain and maintain excellent results in sick pts

- High MELD patients
- Obviously shot selection
- Identification of those that will not do well
  - ? Vent dependent
  - ? Pressor dependent
- Transplant them earlier – earlier access to livers
  - Renal failure of shorter duration
  - Fewer SLK
  - Higher likelihood of native renal recovery
- Donor selection
  - High risk donors benefit sicker pts most….BUT
  - Consider for highest risk recipients – donor age, COD, Cr, CIT, out of region offer, and whether the risks are prohibitive

Maintain excellent outcomes in sick patients

- Get livers to high MELD patients faster- more access to sicker patients
  - Less duration of renal failure (possibly fewer SLK transplants)
  - Less prone to other fatal complications, sepsis, bleeding
  - Reduce costs
- Avoid futile transplants
  - Stay true to being good stewards of precious national resource
  - Intubation/vent dependent with high support needs
  - High pressor requirements going into liver transplants
  - Centers need to recognize who is too sick to transplant
    - Should be held responsible for both risk adjusted (O:E) and non risk adjusted (absolute) outcomes
- Should the allocation system determine who is too sick to transplant?

Allocation is related but different from distribution

- Allocation by MELD (sickest first) has been associate with better, not worse outcomes
- Centers that transplant at high MELD scores can still maintain excellent results – many examples
- Centers that transplant at lower MELD scores do not all have as good results -
- Competition results in differences in center behavior (and likely performance), and can be a positive influence
- Wider distribution areas that have logically designed borders can minimize disparity, gain access for the sicker patient
- We all need to hold ourselves accountable for outcomes, both risk adjusted and non-risk adjusted

Allocation system

- Do we as a transplant community want the allocation system to determine who is too sick to transplant?
- Or should transplant professionals, physicians, surgeons etc continue to make that call?
- We should clearly continue to hold accountable ALL transplant centers for their outcomes
  - Risk adjusted AND non risk adjusted outcomes