Disparities in Liver Transplant Allocation: An Update on MELD Allocation System

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Historical Context: We did what worked

NOTA led to creation of OPTN

Allocation = Distribution + Ranking
Disparities arise when supply does not meet demand

All policy changes attempt to strike a balance between supply and demand

DHHS release governing rules for the OPTN known as the “Final Rule”:

1. “[Set] priority rankings... through objective and measurable criteria”
2. “Distribute organs over as broad a geographic area as feasible”
3. “Reduce inter-transplant program variability”
In response to Final Rule, MELD instituted

1. “[Set] priority rankings... through objective and measurable criteria”

MELD instituted on February 27, 2002

Benefits:
- Objective
- Transparent
- Continuous
- Effective

MELD also had an effect on distribution

Merion study leads to change: Regional Share 15

Regional Share 15
Organs must be in the following order:
• Locally for patients with MELD > 15
• Regionally for patients with MELD > 15
• Locally for patients with MELD < 15

Result: 36% decrease in the number of patients receiving a transplant with MELD <15

High MELD at higher risk of death than status 1A patients

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<tbody>
<tr>
<td>HR</td>
<td>1.10</td>
<td>1.18</td>
<td>1.40</td>
<td>1.78</td>
<td>2.17</td>
<td>2.66</td>
<td>3.14</td>
<td>3.66</td>
<td>4.18</td>
<td>4.68</td>
<td>5.08</td>
<td>5.48</td>
<td>5.98</td>
<td>6.77</td>
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<tr>
<td>P-value</td>
<td>0.5</td>
<td>0.003</td>
<td>0.0003</td>
<td>0.0003</td>
<td>0.008</td>
<td>0.044</td>
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Sharma et al. End-stage liver disease candidates at the highest model of end-stage liver disease scores have higher wait-list mortality than status 1A candidates. Hepatology. 2012;55(1):192-198.
Share 35 instituted decrease death amongst the sickest listed patients

Regional Share 35/National Share 15 (2013)

Order of consideration:
• Local patients MELD ≥ 35
• Regional patients MELD ≥ 35
• Local patients MELD ≥ 15
• National patients MELD ≥ 15

Share 35 leads to overall decrease in mortality

• ↑ total number of transplants
• ↓ number of liver discarded
• ↓ in mortality (30%)
• ↑ the average MELD score at time of tx
National survival the same following Share 35

Two regions with increase in mortality following Share 35 policy

MELD-Na is a better predictor of waitlist mortality than MELD


MELD-Na is a better predictor of waitlist mortality than MELD


MELD-Na is a better predictor of waitlist mortality than MELD

HCC patients advantaged in previous MELD system

New HCC exception rules hope to even the playing field

**New HCC exception policy (October 2015)**
- patients initially listed with native MELD
- still within Milan at 6 months -> list at 28
- increase every 3 months
- score capped at 34 (not eligible to enter Share 35)
Geographic disparities despite changes to original allocation system

4 district model results in largest changes in lives saved
8 districts provides improvements and requires less organ transport

Support for redistricting in lives saved

Table 1: Results of Optimized Redistricting Plans (5-year LSAM Simulation)

<table>
<thead>
<tr>
<th>Districts</th>
<th>Standard deviation, MELD @ Transplant</th>
<th>% of Transplants with MELD scores &lt;15</th>
<th>% of Transplants with MELD scores MELD &gt;25</th>
<th>% Pediatric</th>
<th>Net total deaths</th>
<th>Net waitlist deaths</th>
</tr>
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<tbody>
<tr>
<td>4</td>
<td>1.87</td>
<td>2.5%</td>
<td>64.3%</td>
<td>8.7%</td>
<td>-553.8</td>
<td>-581.1</td>
</tr>
<tr>
<td>8</td>
<td>2.08</td>
<td>3.7%</td>
<td>59.6%</td>
<td>8.1%</td>
<td>-332.4</td>
<td>-342.1</td>
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<tr>
<td>Current System</td>
<td>3.01</td>
<td>5.8%</td>
<td>50.1%</td>
<td>7.5%</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Regional</td>
<td>3.26</td>
<td>5.5%</td>
<td>54.3%</td>
<td>7.7%</td>
<td>-164.6</td>
<td>-122.4</td>
</tr>
<tr>
<td>National</td>
<td>1.66</td>
<td>1.9%</td>
<td>83.3%</td>
<td>10.4%</td>
<td>-343.6</td>
<td>-509.9</td>
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Allocation: a moving target

**Goal:** Matching supply and demand
Deceased liver donor = incident listings MELD > 15

Future changes:
- Redistricting (4 districts, 8 districts, national)
- Additional HCC exception changes (including AFP considerations, treatment and recurrence)