

**Table S1.** Houston Methodist Hospital guidelines for choosing candidates and donors for liver retransplantation.

## **Recipient Selection**

### Inclusion

- **Medical Need** – patients with end-stage liver disease / graft failure whose survival would likely be improved by liver retransplantation
  - Patients with an urgent need, eg, primary nonfunction
  - Model for End-stage Liver Disease (MELD) score  $\geq 15$

### Exclusion

- **Compliance** – patients who cannot comply with recommended medical care, including attending visits, taking prescriptions, substance use abstention, etc.
- **Medical contra-indications** – conditions not reversible with retransplantation
  - Severe active infections
  - Advanced malignancies, locally and/or extra-hepatic
- **Surgical contra-indications** – conditions not anatomically permissive of retransplantation, such as poor vessel quality

## **Donor Selection**

- Donation after circulatory death grafts are allowed if they meet our center's criteria,<sup>50</sup> including:
  - Donor age < 50 years
  - Donor body mass index < 35 kg/m<sup>2</sup>
  - Donor warm ischemia time < 30 minutes

**Table S2.** Recipient, donor, and perioperative variables (not included in multivariable analysis) at first liver transplant for patients who only needed a single liver transplant (single LT) compared to patients requiring liver retransplant (reLT).

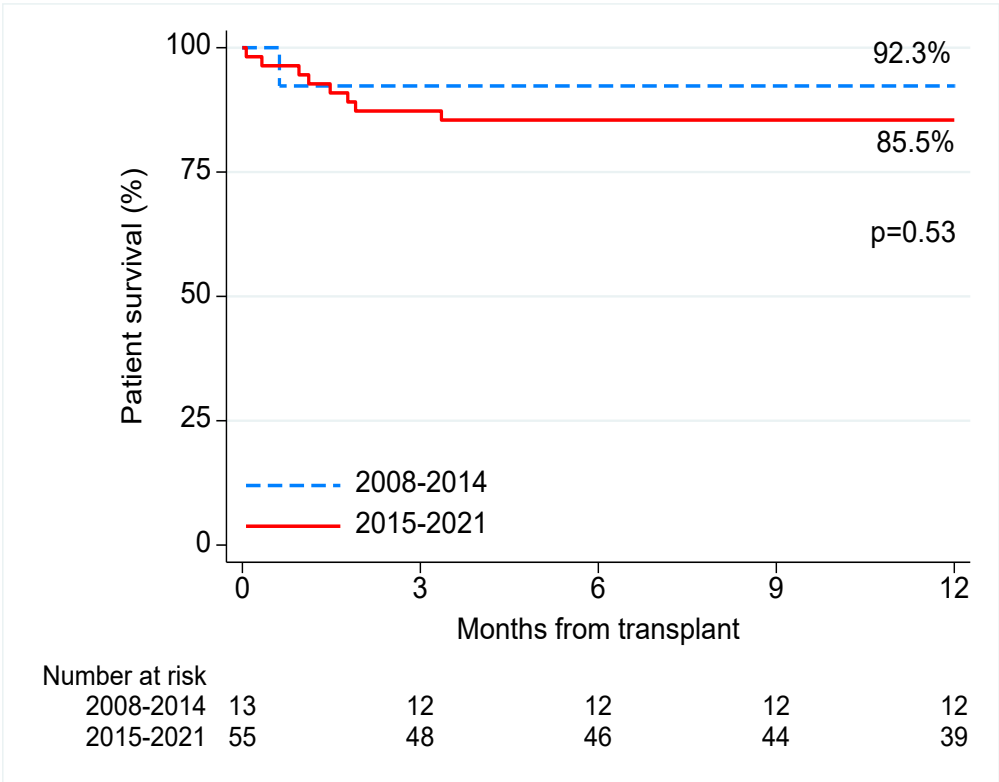
	Total (N=1325)	Single LT (n=1268)	reLT ( index LT) (n=57)	Bivariable p-value	Univariable	
					OR (95% CI)	p-value
<b>Recipient characteristics</b>						
Gender				0.44		
Female	516 (38.9%)	491 (38.7%)	25 (43.9%)		(reference)	
Male	809 (61.1%)	777 (61.3%)	32 (56.1%)		0.81 (0.47, 1.38)	0.44
Body mass index (kg/m <sup>2</sup> )				0.86		
<18.5	29 (2.2%)	28 (2.2%)	1 (1.8%)		0.90 (0.11, 7.10)	0.92
18.5-24.9	339 (25.8%)	326 (26.0%)	13 (22.8%)		(reference)	
25.0-29.9	416 (31.7%)	399 (31.8%)	17 (29.8%)		1.07 (0.51, 2.23)	0.86
≥30	528 (40.2%)	502 (40.0%)	26 (45.6%)		1.30 (0.66, 2.56)	0.45
Blood type				0.30		
A	471 (35.5%)	457 (36.0%)	14 (24.6%)		0.60 (0.32, 1.15)	0.13
B	175 (13.2%)	166 (13.1%)	9 (15.8%)		1.07 (0.50, 2.29)	0.87
AB	58 (4.4%)	54 (4.3%)	4 (7.0%)		1.46 (0.50, 4.30)	0.49
O	621 (46.9%)	591 (46.6%)	30 (52.6%)		(reference)	
MELD/status at transplant				0.28		
6-15	104 (7.8%)	98 (7.7%)	6 (10.5%)		(reference)	
16-29	379 (28.6%)	364 (28.7%)	15 (26.3%)		0.67 (0.25, 1.78)	0.43
30-40	815 (61.5%)	782 (61.7%)	33 (57.9%)		0.69 (0.28, 1.69)	0.42
Status 1A	27 (2.0%)	24 (1.9%)	3 (5.3%)		2.04 (0.48, 8.76)	0.34
Time on waitlist (days), median (IQR)	128.0 (13.0, 405.0)	126.5 (14.0, 406.0)	245.0 (10.0, 393.0)	0.72		
Medical condition at transplant				0.73		
Home	566 (42.7%)	544 (42.9%)	22 (38.6%)		(reference)	
Hospital	192 (14.5%)	182 (14.4%)	10 (17.5%)		1.36 (0.63, 2.92)	0.43
ICU	567 (42.8%)	542 (42.7%)	25 (43.9%)		1.14 (0.64, 2.05)	0.66
On preoperative ventilation				0.54		
No	1,021 (77.1%)	979 (77.2%)	42 (73.7%)		(reference)	
Yes	304 (22.9%)	289 (22.8%)	15 (26.3%)		1.21 (0.66, 2.21)	0.54
On preoperative dialysis				0.94		
No	826 (62.7%)	790 (62.7%)	36 (63.2%)		(reference)	
Yes	491 (37.3%)	470 (37.3%)	21 (36.8%)		0.98 (0.57, 1.70)	0.94
Diabetes				0.42		
No	907 (68.8%)	865 (68.6%)	42 (73.7%)		(reference)	
Yes	411 (31.2%)	396 (31.4%)	15 (26.3%)		0.78 (0.43, 1.42)	0.42

Recipient HCV serostatus				0.24		
Negative	946 (71.4%)	900 (71.0%)	46 (80.7%)		(reference)	
Positive	363 (27.4%)	352 (27.8%)	11 (19.3%)		0.61 (0.31, 1.19)	0.15
Unknown/Not done	16 (1.2%)	16 (1.3%)	0 (0.0%)		--	--
Recipient HIV serostatus				0.12		
Negative	1,057 (79.8%)	1,007 (79.4%)	50 (87.7%)		(reference)	
Positive	8 (0.6%)	7 (0.6%)	1 (1.8%)		2.88 (0.35, 23.84)	0.33
Unknown/Not done	260 (19.6%)	254 (20.0%)	6 (10.5%)		0.48 (0.20, 1.12)	0.09
<b>Donor characteristics</b>						
Donor age at transplant (years), median (IQR)	34.0 (23.0, 47.0)	34.0 (23.0, 47.0)	38.0 (26.0, 46.0)	0.44	1.01 (0.99, 1.02)	0.55
Donor gender				0.12		
Female	497 (37.5%)	470 (37.1%)	27 (47.4%)		(reference)	
Male	828 (62.5%)	798 (62.9%)	30 (52.6%)		0.65 (0.38, 1.11)	0.12
Race/Ethnicity				0.43		
White	689 (52.0%)	662 (52.2%)	27 (47.4%)		(reference)	
Black	254 (19.2%)	246 (19.4%)	8 (14.0%)		0.80 (0.36, 1.78)	0.58
Hispanic	343 (25.9%)	323 (25.5%)	20 (35.1%)		1.52 (0.84, 2.75)	0.17
Asian	30 (2.3%)	28 (2.2%)	2 (3.5%)		1.75 (0.40, 7.73)	0.46
Other	9 (0.7%)	9 (0.7%)	0 (0.0%)		--	--
Body mass index, median (IQR)	26.1 (23.0, 30.1)	26.1 (23.0, 30.1)	26.8 (23.2, 30.0)	0.65	1.01 (0.96, 1.05)	0.79
Donor after cardiac death (DCD)				0.27		
No	1,270 (95.8%)	1,217 (96.0%)	53 (93.0%)		(reference)	
Yes	55 (4.2%)	51 (4.0%)	4 (7.0%)		1.80 (0.63, 5.17)	0.27
Donor hospital LOS (days), median (IQR)	4.0 (3.0, 6.0)	4.0 (3.0, 6.0)	4.0 (3.0, 5.0)	0.29	--	--
Donor terminal creatinine (mg/mL), median (IQR)	1.0 (0.7, 1.6)	1.0 (0.7, 1.6)	1.0 (0.7, 1.8)	0.79	1.07 (0.95, 1.21)	0.24
Donor terminal blood urea nitrogen (mg/mL), median (IQR)	18.0 (12.0, 28.0)	18.0 (12.0, 29.0)	17.0 (12.0, 27.0)	0.76	1.01 (1.00, 1.02)	0.10
Donor terminal AST (UI), median (IQR)	55.0 (29.0, 102.0)	55.0 (29.0, 102.5)	38.0 (26.0, 82.0)	0.23	1.00 (1.00, 1.00)	0.25
Donor terminal ALT (UI), median (IQR)	39.0 (23.0, 79.0)	39.0 (23.0, 79.0)	33.0 (22.0, 61.0)	0.31	1.00 (1.00, 1.00)	0.28
Donor terminal bilirubin (mg/mL), median (IQR)	0.7 (0.5, 1.0)	0.7 (0.5, 1.0)	0.6 (0.4, 0.9)	0.33	0.87 (0.59, 1.29)	0.50

KDPI				<b>0.03</b>		
<80%	1,129 (88.0%)	1,084 (88.4%)	45 (78.9%)		(reference)	
≥80%	154 (12.0%)	142 (11.6%)	12 (21.1%)		2.04 (1.05, 3.94)	<b>0.04</b>
Donor CMV serostatus				0.63		
Negative	356 (27.1%)	339 (26.9%)	17 (29.8%)		(reference)	
Positive	960 (72.9%)	920 (73.1%)	40 (70.2%)		0.87 (0.48, 1.55)	0.63
<b>Perioperative characteristics</b>						
Cold ischemic time (hours), median (IQR)	6.1 (4.8, 8.0)	6.1 (4.8, 8.0)	6.2 (4.8, 8.0)	0.83	0.97 (0.86, 1.08)	0.58
Intraoperative PRBC administration (units), median (IQR)	7.0 (3.0, 12.0)	7.0 (2.0, 12.0)	8.0 (6.0, 14.0)	<b>0.04</b>	1.02 (1.00, 1.05)	0.10

Values are in number (%) unless otherwise specified; IQR, interquartile range; ICU, intensive care unit; LT, liver transplantation; reLT, liver re-transplantation; NASH, non-alcoholic steatohepatitis

**Figure S1.** Patient overall survival up to 1 years stratified by era of transplantation



**Figure S2.** Patient overall survival up to 3 years stratified by era of transplantation

