

	Unadjusted			Adjusted		
	OR	95% CI	p Value	OR	95% CI	p Value
BMI >30 kg/m ²	0.5208	0.5005 – 0.4519	<0.0001	0.5094	0.4866 – 0.5333	<0.0001
Age (per year)	0.9724	0.9711 – 0.9736	<0.0001	0.9713	0.9696 – 1.0295	<0.0001
Ethnicity			<0.0001			<0.0001
White	<i>Reference</i>			<i>Reference</i>		
Black	1.4902	1.4057 – 1.5799		1.4726	1.3771 – 1.5748	
Hispanic	0.7755	0.7344 – 0.8188		0.6969	0.6547 – 0.7418	
Asian	0.7893	0.7053 – 0.8833		0.7425	0.6553 – 0.8414	
Other	0.9650	0.8184 – 1.1379		0.8432	0.7018 – 1.0132	
Blood Type			<0.0001			<0.0001
O	<i>Reference</i>			<i>Reference</i>		
A	0.9925	0.9511 – 1.0356		0.9907	0.9447 – 1.0389	
B	0.9414	0.8851 – 1.0014		0.8481	0.7916 – 0.9085	
AB	0.7365	0.6658 – 0.8147		0.6441	0.5762 – 0.7199	
Cause of Death			<0.0001			<0.0001
Anoxia	<i>Reference</i>			<i>Reference</i>		
CVA/Stroke	0.7409	0.7054 – 0.7784		0.6921	0.6509 – 0.7360	
Trauma	1.4242	1.3476 – 1.5050		1.0567	0.9877 – 1.1305	
CNS Tumor	0.9772	0.7448 – 1.2821		0.5118	0.3832 – 0.6835	
Other	0.8771	0.7652 – 1.0054		0.6452	0.5524 – 0.7536	
Hypertension (Y)	0.5438	0.5230 – 0.5655	<0.0001	0.8194	0.7780 – 0.8629	<0.0001
Diabetes (Y)	0.5055	0.4808 – 0.5315	<0.0001	0.6210	0.5847 – 0.6594	<0.0001
Heavy Alcohol Use	0.4558	0.4358 – 0.4768	<0.0001	0.4391	0.4170 – 0.4624	<0.0001
Cigarette Use	0.6993	0.6707 – 0.7290	<0.0001	0.9109	0.8677 – 0.9562	<0.0001
Log Serum AST ^a	0.6722	0.6599 – 0.6858	<0.0001	0.7166	0.6913 – 0.7430	<0.0001
Log Serum ALT ^a	0.7091	0.6967 – 0.7216	<0.0001	0.7800	0.7534 – 0.8076	<0.0001
Log Serum Bilirubin ^a	0.5947	0.5794 – 0.6104	<0.0001	0.5933	0.5756 – 0.6114	<0.0001
Log Serum Creatinine ^a	0.8971	0.8711 – 0.9238	<0.0001	1.2549	1.2089 – 1.3027	<0.0001

^aSerum labs log normalized and OR reported per-unit increase

Table S1. Factors Associated with Liver Allograft Utilization. Univariate and multivariable analyses were performed to determine likelihood of organ utilization. Adjusted and unadjusted odds ratios for graft utilization are presented.

	BMI <30 kg/m ² (n= 46,192)	hBMI ≥30kg/m ² (n= 20,872)	p Value
Age (years; median, IQR)	44 (28 – 55)	48 (37 – 57)	<0.0001
Gender (Female; n, %)	17 957 (38.9%)	10 036 (48.1%)	<0.0001
Ethnicity			<0.0001
White	30 500 (66.0%)	13 651 (65.4%)	
Black	7435 (16.1%)	3897 (18.7%)	
Hispanic	6153 (13.3%)	2737 (13.1%)	
Asian	1503 (3.3%)	280 (1.3%)	
Other	601 (1.3%)	307 (1.5%)	
Blood Type			0.0019
O	22 407 (48.5%)	9868 (47.3%)	
A	16 642 (36.0%)	7843 (37.6%)	
B	5576 (12.1%)	2470 (11.8%)	
AB	1566 (3.4%)	691 (3.3%)	
Cause of Death			<0.0001
Anoxia	9755 (21.1%)	6325 (30.3%)	
CVA/Stroke	18 800 (40.7%)	9557 (45.8%)	
Trauma	16 505 (35.7%)	4437 (21.3%)	
CNS Tumor	235 (0.5%)	104 (0.5%)	
Other	897 (1.9%)	449 (2.2%)	
Predonation Biopsy	16 212 (35.5%)	11 831 (57.7%)	<0.0001
Macrosteatosis (biopsy samples only)	5 (0 – 10)	10 (4 – 20)	<0.0001
Macrosteatosis ≥30%	1728 (12.2%)	2223 (21.2%)	<0.0001
Donor Medical History			
Hypertension	15 253 (33.3%)	11 352 (54.8%)	<0.0001
Diabetes	4462 (9.7%)	4599 (13.6%)	<0.0001
Any Cancer	1725 (3.8%)	890 (4.3%)	0.0013
Prior Myocardial Infarction	1651 (3.6%)	1123 (5.5%)	<0.0001
Heavy Alcohol Use	9241 (20.4%)	2837 (13.8%)	<0.0001
Cigarette Smoker	32 626 (71.8%)	14 732 (71.8%)	0.8737
Any Drug Use	19 375 (41.9%)	7015 (33.6%)	<0.0001
Donor Predonation Labs			
Log Serum AST	3.78 (3.26 – 4.44)	3.76 (3.22 – 4.43)	0.0002
Log Serum ALT	3.53 (3.04 – 4.20)	3.64 (3.14 – 4.30)	<0.0001
Log Total Serum Bilirubin	-0.36 (-0.69 – 0.18)	-0.36 (-0.69 – 0.09)	<0.0001
Log Serum Cr	0.02 (-0.22 – 0.41)	0.18 (-0.11 – 0.64)	<0.0001
Donor Utilization			
Liver Transplanted	38 958 (84.3%)	15 386 (73.7%)	<0.0001
Split Liver Donation	379 (1.0%)	26 (0.2%)	<0.0001
Multi-Organ Donation	32 217 (69.8%)	11 696 (56.0%)	<0.0001

Table S2. Characteristics of Potential Donors by BMI. Donors with BMI <30 kg/m² are compared to those with BMI ≥30kg/m² (hBMI). P values <0.01 considered significant.

Table S3.

OPTN Region												
	1	2	3	4	5	6	7	8	9	10	11	p-Value
Potential Donors	1973	8499	11 005	6499	10 074	2165	5112	4660	3384	5869	7824	
Potential hBMI Donors	594 (30.1%)	2863 (33.7%)	3189 (29.0%)	1966 (30.3%)	2893 (28.7%)	613 (28.3%)	1696 (33.2%)	1499 (32.2%)	1024 (30.3%)	2026 (34.5%)	2509 (32.1%)	<0.0001
Overall Donor Utilization	1663 (84.3%)	6521 (76.6%)	9467 (85.9%)	5231 (80.4%)	7799 (77.3%)	1587 (73.2%)	4210 (82.3%)	3926 (84.2%)	2756 (81.2%)	4738 (80.7%)	6513 (83.1%)	<0.0001
hBMI Donor Utilization	463 (78.0%)	1963 (68.6%)	2555 (80.1%)	1439 (73.2%)	1985 (68.6%)	367 (59.9%)	1291 (76.1%)	1159 (77.3%)	771 (75.3%)	1477 (72.9%)	1916 (76.4%)	<0.0001
Predonation Biopsy (all)	1031 (52.4%)	4165 (49.1%)	3656 (33.5%)	2428 (37.9%)	3257 (33.2%)	1123 (52.8%)	2550 (51.7%)	2447 (52.8%)	1464 (43.5%)	1882 (32.3%)	4078 (52.8%)	<0.0001
hBMI Donor Biopsy	416 (70.3%)	1796 (63.0%)	1457 (46.3%)	1059 (54.8%)	1386 (49.7%)	434 (72.8%)	1089 (67.4%)	1032 (69.4%)	561 (55.1%)	903 (45.1%)	1698 (69.0%)	<0.0001
MaS ≥30% (biopsied donors)	230 (23.8%)	662 (17.7%)	432 (13.7%)	289 (14.2%)	491 (18.4%)	107 (10.4%)	308 (13.9%)	314 (14.2%)	275 (20.4%)	267 (16.6%)	579 (15.8%)	<0.0001
hBMI Donors with MaS ≥30%	114 (29.2%)	387 (23.3%)	252 (19.9%)	160 (18.0%)	273 (23.8%)	61 (15.5%)	169 (17.4%)	189 (20.0%)	132 (25.3%)	164 (21.1%)	322 (20.8%)	<0.0001
MaS ≥30% Garfts Utilized	121 (52.6%)	190 (28.7%)	222 (51.4%)	107 (37.0%)	198 (40.3%)	12 (11.2%)	122 (39.6%)	131 (41.7%)	130 (47.3%)	96 (36.0%)	290 (50.1%)	<0.0001
hBMI MaS ≥30% Utilized	67 (58.8%)	103 (26.6%)	132 (52.4%)	57 (35.6%)	119 (43.6%)	8 (13.1%)	72 (42.6%)	71 (37.6%)	62 (47.0%)	55 (33.5%)	156 (48.5%)	<0.0001
MELD Score (Median, IQR)	18 (12-31)	22 (13-31)	20 (15-27)	20 (13-30)	25 (13-36)	19 (13-27)	23 (14-33)	21 (14-29)	19 (12-31)	18 (13-26)	19 (14-26)	<0.0001
Age (yrs)	56 (50-61)	56 (50-61)	56 (50-62)	56 (50-61)	56 (50-62)	57 (51-61)	56 (49-61)	56 (49-61)	57 (50-63)	56 (49-61)	56 (50-61)	<0.0001
Etiology of ESLD	<0.0001											
Acute	89 (4.9%)	283 (4.7%)	347 (3.9%)	161 (3.3%)	475 (6.5%)	56 (3.7%)	214 (5.5%)	128 (3.5%)	182 (5.5%)	178 (3.9%)	217 (3.7%)	
Alcohol	274 (15.0%)	865 (14.3%)	1098 (12.4%)	547 (11.2%)	813 (11.1%)	159 (10.4%)	648 (16.5%)	380 (10.4%)	320 (9.6%)	530 (11.5%)	624 (10.6%)	
CC/NASH	157 (8.6%)	577 (9.5%)	1,359 (15.3%)	457 (9.3%)	695 (9.5%)	138 (9.1%)	423 (10.8%)	470 (12.9%)	261 (7.9%)	717 (15.5%)	1,025 (17.4%)	
HCV	481 (26.4%)	1853 (30.6%)	2266 (25.5%)	1122 (22.9%)	1921 (26.2%)	481 (31.6%)	758 (19.3%)	897 (24.5%)	721 (21.7%)	1135 (24.6%)	1651 (28.0%)	
HCC	536 (29.4%)	1315 (21.8%)	1867 (21.0%)	1672 (34.2%)	2077 (28.3%)	389 (25.5%)	935 (23.8%)	875 (23.9%)	1071 (32.3%)	891 (19.3%)	979 (16.6%)	

Table S3. Regional Differences in Donor Utilization and Recipient Characteristics. Eleven OPTN regions are identified and are compared for donor characteristics and utilization rates based. Differences in recipient population are presented for select characteristics. Regions were compared using ANOVA or chi-square analysis, $p < 0.01$ considered significant.

	Unadjusted			Adjusted		
	HR	95% CI	p Value	HR	95% CI	p Value
Donor Characteristics						
Age (per year)	1.0096	1.0084 – 1.0108	<0.0001	1.0087	1.0071 – 1.0102	<0.0001
Ethnicity			<0.0001			0.0003
White	<i>Reference</i>			<i>Reference</i>		
Black	1.0872	1.0323 – 1.1450		1.0687	1.0118 – 1.1288	
Hispanic	1.1192	1.0541 – 1.1884		1.1235	1.0552 – 1.1963	
Asian	1.2189	1.0804 – 1.3751		1.1787	1.0423 – 1.3329	
Other	1.0658	0.8928 – 1.2722		1.1137	0.9310 – 1.3321	
Cause of Death			<0.0001			<0.0001
Anoxia	<i>Reference</i>			<i>Reference</i>		
CVA/Stroke	1.2837	1.2183 – 1.3527		1.1437	1.0803 – 1.2107	
Trauma	0.9758	0.9223 – 1.0324		1.0393	0.9799 – 1.1023	
CNS Tumor	1.1964	0.9062 – 1.5797		1.2501	0.9455 – 1.6528	
Other	1.0091	0.8644 – 1.1780		1.0087	0.8603 – 1.1826	
Diabetes (Y)	1.2480	1.1782 – 1.3210	<0.0001	1.0989	1.0332 – 1.1688	0.0109
Hx of Any Drug Use	0.8526	0.8176 – 0.8890	<0.0001	0.9240	0.8830 – 0.9667	0.0006
Cigarette Use	1.1256	1.0769 – 1.1762	<0.0001	1.0539	1.0047 – 1.1055	0.0315
Log Serum Creatinine ^a	1.0525	1.0214 – 1.0846	0.0008	1.0407	1.0077 – 1.0749	0.0154
Cold Ischemic Time			<0.0001			<0.0001
<8 Hours	<i>Reference</i>			<i>Reference</i>		
8 to <12 Hours	1.1749	1.1220 – 1.2304		1.1947	1.1407 – 1.2513	
12 Hours or more	1.3433	1.2193 – 1.4761		1.4366	1.3052 – 1.5812	
Recipient Characteristics						
Age	1.0080	1.0060 – 1.0100	<0.0001	1.0108	1.0085 – 1.0131	<0.0001
MELD Score ^b	1.0129	1.0109 – 1.0149	<0.0001	1.0192	1.0170 – 1.0215	<0.0001
Hx Prior Txp	1.9107	1.7872 – 2.0403	<0.0001	1.9119	1.7514 – 2.0872	<0.0001
Ethnicity			<0.0001			<0.0001
White	<i>Reference</i>			<i>Reference</i>		
Black	1.3330	1.2535 – 1.4176		1.2911	1.2114 – 1.3761	
Hispanic	1.0166	0.9574 – 1.0795		0.9565	0.8989 – 1.0177	
Asian	0.8222	0.7403 – 0.9131		0.8253	0.7390 – 0.9217	
Other	0.9097	0.7535 – 1.0983		0.9411	0.7786 – 1.1375	
Etiology of ESLD ^c			<0.0001			<0.0001
Acute	<i>Reference</i>			<i>Reference</i>		
Alcohol	0.7622	0.6813 – 0.8527		0.7756	0.6903 – 0.8714	
Hepatitis C	1.0558	0.9565 – 1.1654		1.1078	0.9993 – 1.2281	
HCC	0.9836	0.8901 – 1.0868		1.1735	1.0516 – 1.3094	
CC/NASH	0.8757	0.7847 – 0.9773		0.8809	0.7847 – 0.9889	
^a Serum labs log normalized and OR reported per-unit increase						
^b Lab MELD score reported						
^c selected etiologies of ESLD reported						

Table S4. Base Cox Proportional Hazards Model of 3-year Graft Survival. Donor and recipient pairs were evaluated for predictors of 3-year graft survival using univariate and multivariate Cox proportional hazards analyses. Model used as base for additional Regional and donor BMI and biopsy result comparisons. P values <0.05 considered significant for multivariable modeling.

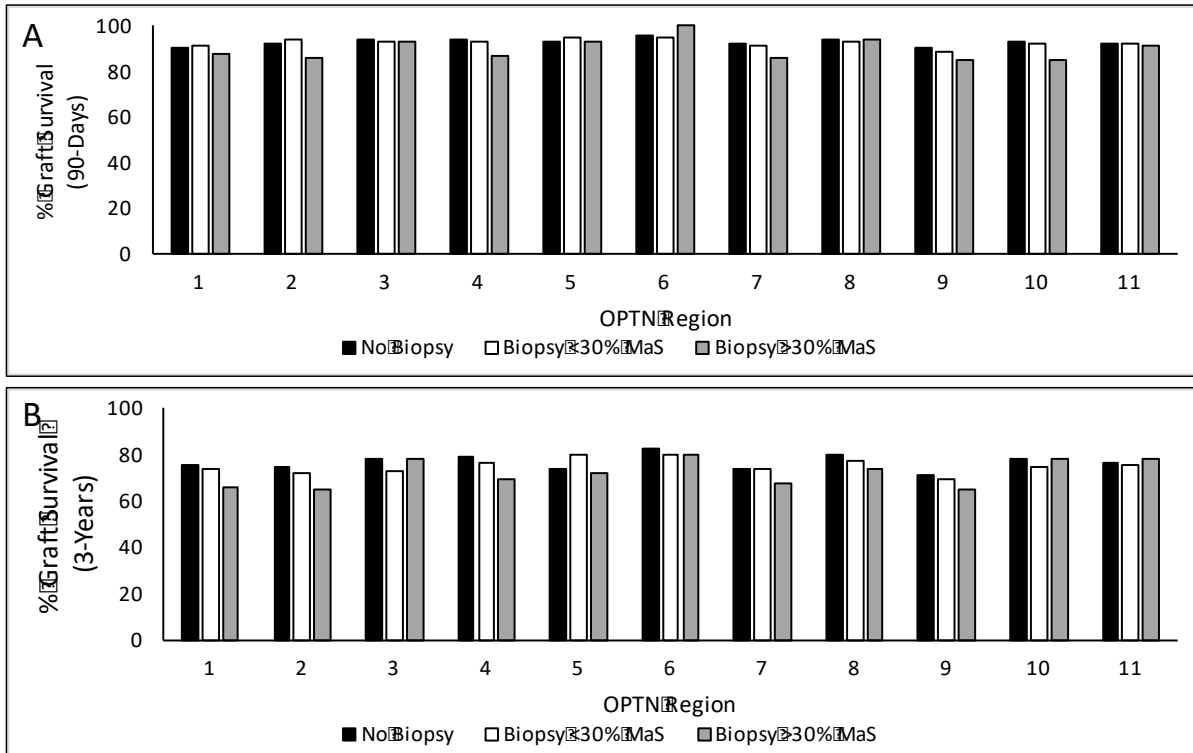


Figure S1. Graft Survival by OPTN Region. Graft survival at (A) 90-days and (B) 3-years was evaluated by UNOS OPTN Regions for all transplants and recipients of organs with biopsy showing <30% or ≥30% macrosteatosis. P value <0.0001 identified by chi-square analysis across all regions for each condition.