# Indications for Living Donor Liver Transplantation versus Deceased Donor Liver Transplantation

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## ISSUE

Living donor liver transplant (LDLT) should be considered in *all* patients who are listed for liver transplantation as it both improves the likelihood of successful, timely transplantation, and decreases waitlist mortality. Furthermore, LDLT also importantly increases allograft availability for other potential recipients. There are, however, donor and recipient factors to be considered when pursuing LDLT over DDLT.

## DATA

Innovative approaches to increasing access to liver donor allografts, continues to be driven by a significant gap in the number of available liver grafts and those in need. Indeed, in the United States over 3000 patients are removed from the liver wait list each year because they become too ill or die prior to receiving a liver transplant.(1) While living donor liver transplant (LDLT) is established as the primary source of donor allografts in many parts of Asia, LDLT consistently constitutes approximately 3-5% of liver transplants in the United States.(2) When considering LDLT, one must consider certain scenarios in which living donation may not be an optimal option for certain recipients who are otherwise suitable for deceased donor liver transplantation.

A) Anatomical relative contraindications in a Recipient for Living Donor Liver Transplant:

   a. Patients with main portal vein thrombus not amenable to recanalization

   b. Patient with lack of venous outflow (i.e., Budd Chiari syndrome). Assessment for feasibility of hepatic venous outflow for LDLT feasibility can be considered in this scenario.(3, 4)

c. Patients in whom there is an indication for inferior venacaval replacement (i.e., HCC involving caudate lobe)

B) The following recipient medical scenarios may impact LDLT candidacy:

a. There are lack of guidelines on specific MELD score cutoffs for consideration of LDLT. Prior analyses have shown a survival benefit of LDLT versus deceased donor liver transplantation in low MELD patients (<15) in experienced LDLT centers.(5, 6, 7) Patients with MELD >25 and/or acute liver failure receive priority in the current liver allocation policy and thus there are fewer reports of LDLT in these populations in the U.S. While these situations are higher risk, prior analyses have shown a survival benefit of LDLT in both high MELD patients and those with acute liver failure at experienced centers.(8) Patients with higher MELD or Status 1 patients in the US, with an available donor who can undergo rapid work-up, could be considered on a case-by-case basis.

b. Patients listed for re-transplantation required expertise and careful consideration for LDLT

c. The utility and outcomes of living donor liver transplantation in patients with acute liver failure has not been extensively studied in adult recipients in the US. Data from outside the US indicates that it can done with reasonable outcomes.(9)

d. Need for simultaneous organ transplant (kidney/ heart/ lung). Patients with marginal renal function who may not meet OPTN criteria for simultaneous liver kidney transplant should be considered carefully in the context of LDLT.

e. Liver transplantation candidates with elevated BMI (>40) in whom finding an appropriate sized donor to meet minimum graft-to recipient weight ratio may benefit from medically supervised weight loss to improve candidacy. The utility and safety of approaches such as pre-LT bariatric surgery in this recipient population has yet to be demonstrated.

f. Patients with HCC that meet OPTN criteria benefit from LDLT and may experience a shorter waiting time to transplant. Published data from A2ALL report high post-LDLT recurrent rate in patients with primary hepatocellular carcinomas within Milan criteria that have not yet demonstrated response to locoregional therapy and favorable disease biology.(10) Timing of LDLT should be considered in this context. There are also ongoing studies to evaluate the utility of LDLT in patients with HCC outside of Milan or UCSF criteria.

g. There are ongoing studies to evaluate the role for LDLT in patients with primary or secondary liver cancers that do not currently meet UNOS criteria for transplantation (e.g., intrahepatic cholangiocarcinoma or metastatic colorectal carcinoma).

h. Patients with high risk pulmonary conditions (pulmonary fibrosis/ hepatopulmonary syndrome/ portopulmonary hypertension) should also be considered carefully in the setting of LDLT.

C) Ethical contraindications to Living Donor Liver Transplantation

a. Evidence of living donor coercion or promise of monetary payment beyond financial neutrality of the donor.

b. Living donors outside of center specific inclusion criteria for selection of living donors.

## RECOMMENDATIONS

1. Careful attention to donor and recipient anatomy is critical for success and certain anomalies may prohibit LDLT.
2. Recipient severity of illness can impact outcomes and there is insufficient data in high MELD or Fulminant Liver Failure in the US.
3. Experienced centers may consider higher risk candidates on a case by case basis

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