Living Donor Liver Transplantation: *Recognizing the Right Candidate*

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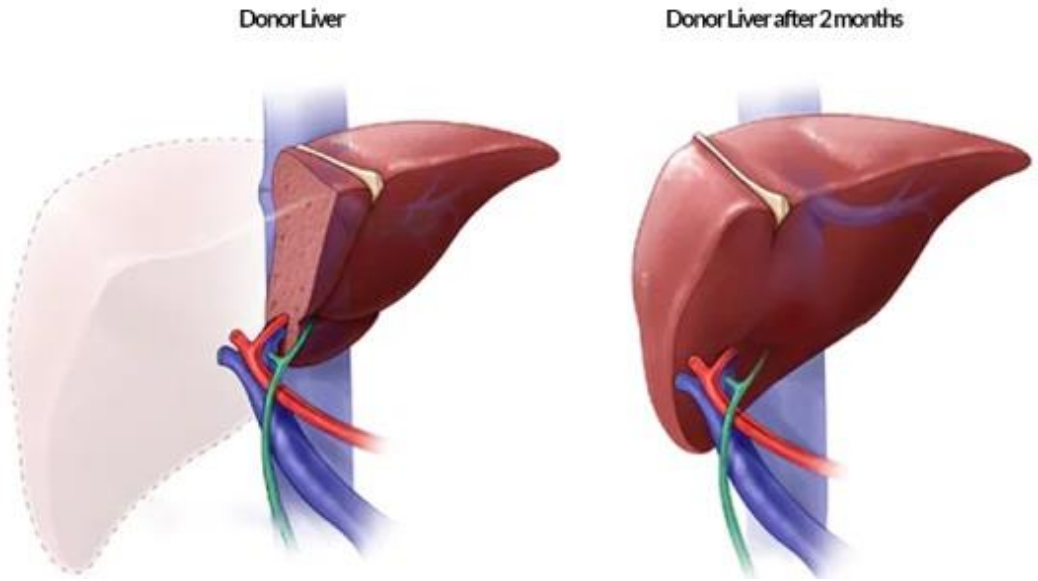
Learning Objectives

1. **Identify** common misconceptions that limit LDLT referral.
2. **Evaluate** donor and recipient eligibility for LDLT.
3. **Apply** a proactive framework for counseling patients about living donation.

5 Common Myths to Debunk

MYTH 1	*"The waitlist is fine — patients will get a liver eventually."*
MYTH 2	*"Living donation is too dangerous for the donor."*
MYTH 3	*"LDLT outcomes are worse than a regular transplant."*
MYTH 4	*"Only certain patients qualify — criteria are too restrictive."*
MYTH 5	*"Finding a living donor is too complicated. That's not my job."*

How LDLT Works: A Two-Team Operation



STEP 1 — DONOR

- R lobe hepatectomy (60–70% donor liver)
- Future liver remnant ≥30–35% required
- Laparoscopic or open approach; 5–7 hr OR time
- Liver regenerates to ~full volume in 6–8 weeks
- Hospital stay: 5–7 days

STEP 2 — BACK TABLE

- Venous outflow reconstruction (hepatic vein, MHV reconstruction)
- Cold ischemic time <2 hrs (vs. 8–12 hrs for DDLT)
- Near-zero preservation injury — graft in excellent condition

STEP 3 — RECIPIENT

- 4 anastomoses: hepatic vein, portal vein, hepatic artery, bile duct
- Biliary reconstruction: duct-to-duct or hepaticojejunostomy
- Two experienced teams operate simultaneously, reducing total time
- ICU 2–3 days; discharge ~7-10 days

Hwang S, et al. Ann Surg. 2010; Dulundu E, et al. Transplantation. 2004;78:574–579; StatPearls Liver Transplantation. 2024

M Y T H 1

“The waitlist is fine – patients will eventually get a liver”

Organ Shortage is Real and Growing

10,660

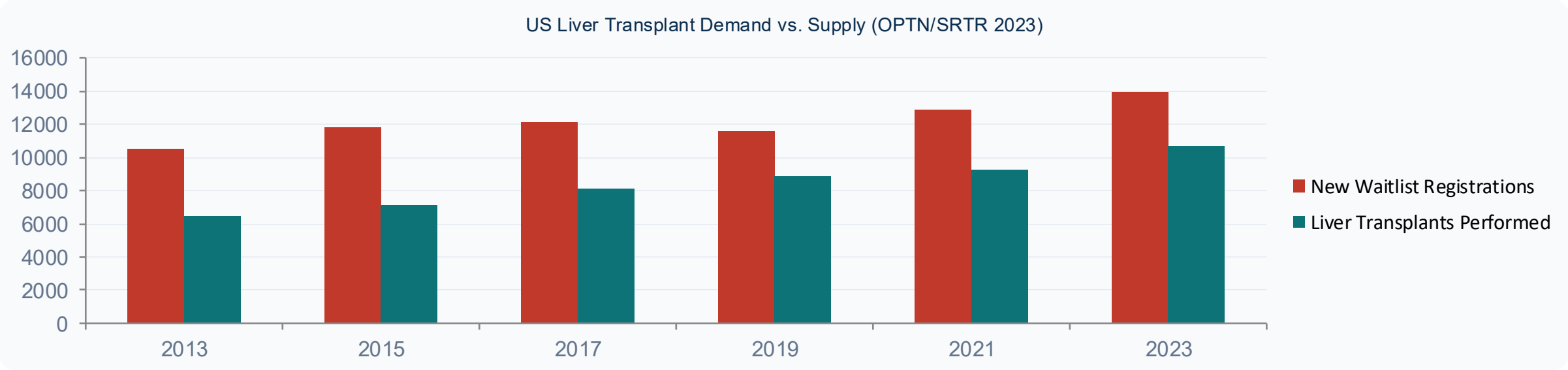
Liver transplants performed (2023 record)

13,954

New adults added to waitlist in 2023 (+8.5% vs prior year)

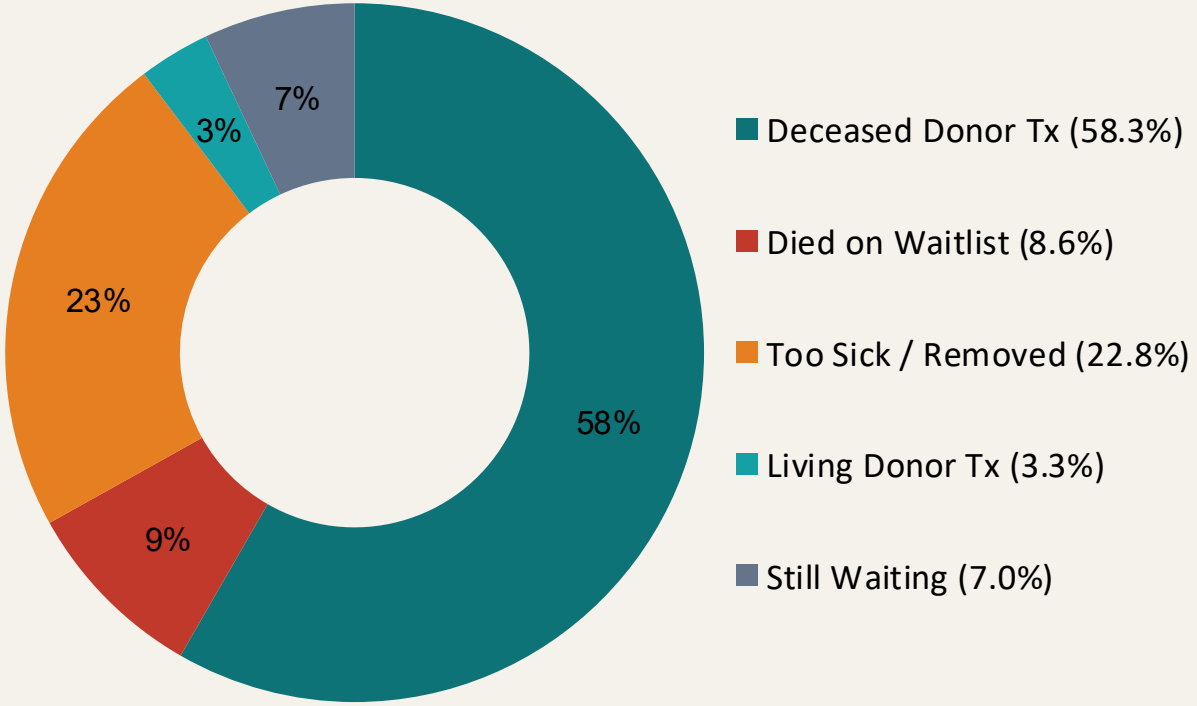
9,745

Adults still waiting at year-end 2023



OPTN/SRTR 2023 Annual Data Report. Am J Transplant. 2025

Death on the Waitlist



17.9

Deaths/100 patient-years
(peak, 2014)

12.9

Deaths/100 patient-years
(current, 2023)

29.4

Deaths/100 pt-yrs
Alcohol-assoc. hepatitis

REALITY: In 2023, 13.0% of waitlist removals were for death or being too sick — these patients never received a transplant.

OPTN/SRTR 2023 Annual Data Report. Am J Transplant. 2025

M Y T H 2

“Living donation is too dangerous for the donor.”

Donor Safety: What the Data Actually Show

Perioperative donor mortality: ~1 death per 5,000 donors (0.02%) in North America

>11,000 donor hepatectomies, 1989–2023

~30%

Experience ANY complication (most minor)

~5–10%

Major complications (bleeding, bile leak, hernia)

~0.02%

Perioperative mortality (~1 in 5,000)

Common Minor Complications

- Wound infection / skin breakdown
- Temporary nerve injury (numbness, tingling)
- Urinary tract infection
- Bile leak (usually managed non-operatively)
- Fatigue, incisional discomfort

Recovery & Long-Term Outcomes

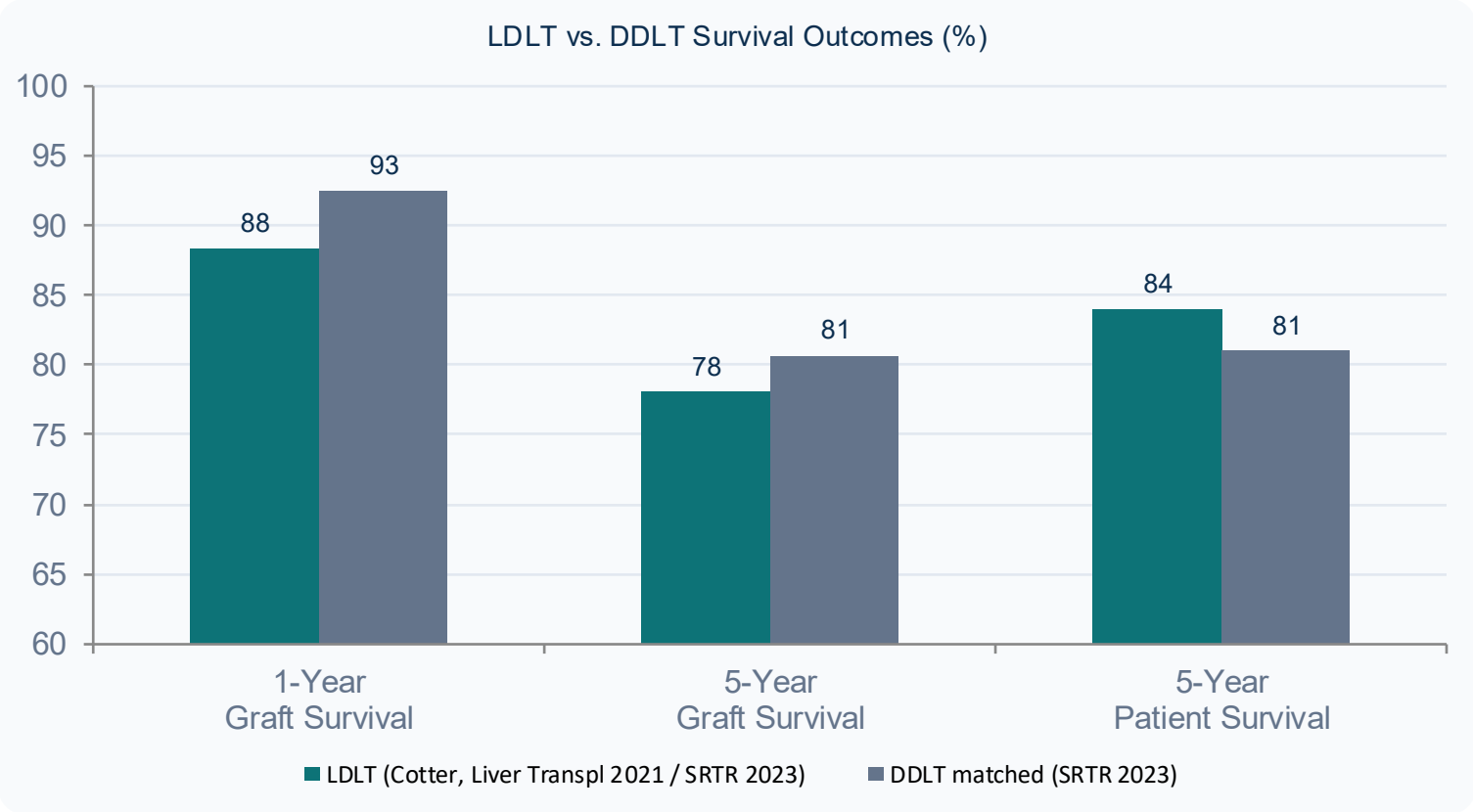
- Hospital stay: 5–7 days (laparoscopic approach)
- Return to work: 4–8 weeks
- Liver fully regenerates in 6–10 weeks
- Long-term quality of life comparable to general population
- Excellent long-term survival vs. matched controls

Emamaullee J, Bourret K, Jadlowiec C, et al. Am J Transplant. 2022; NALLDIG Consortium

M Y T H 3

“LDLT outcomes are worse than regular transplants.”

National Transplantation Outcomes



✓ 5-Year Patient Survival

LDLT patient survival EXCEEDS DDLT at 5 years — SRTR 2022 & 2023 Annual Reports.

1-Year Gap Explained

4-5% lower 1-year graft survival reflects surgical complexity — improves significantly with center volume.

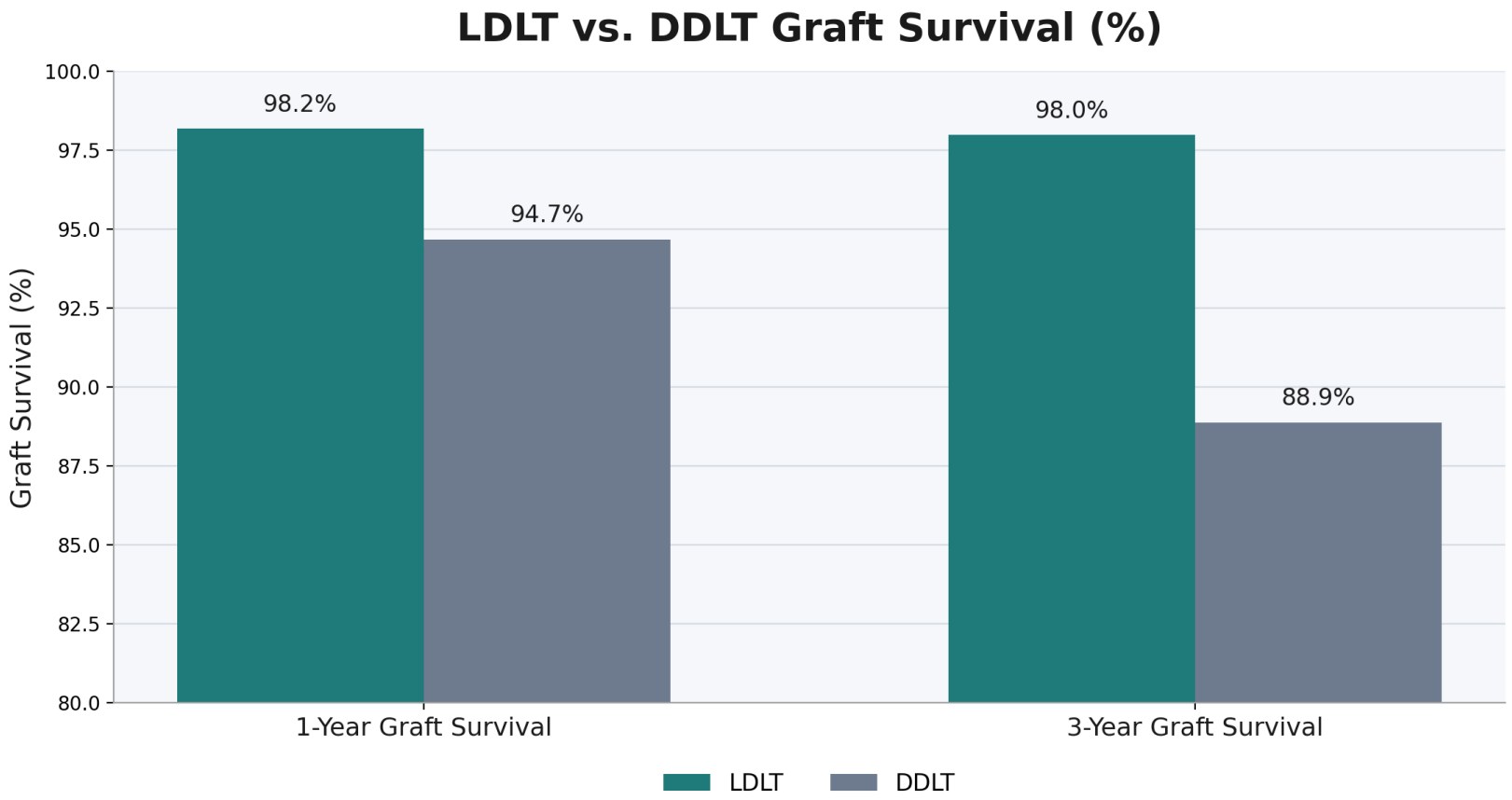
↑ Volume is Everything

Centers doing >20 LDLTs/year achieve 93% vs. 82% 1-year graft survival at low-volume centers.

REALITY: 5-year patient survival after LDLT exceeds DDLT. The 1-year gap reflects surgical complexity, not a fundamental inferiority of living donor organs — and disappears at experienced centers.

OPTN/SRTR 2022 & 2023 Annual Data Reports. Am J Transplant. 2023, 2025; Cotter TP, Bhatt N, Khandelwal N, et al. Liver Transpl. 2021; A2ALL Consortium

UHTI Transplantation Outcomes



✓ 3-Year Patient Survival

LDLT graft survival demonstrates durable benefit beyond the perioperative period.

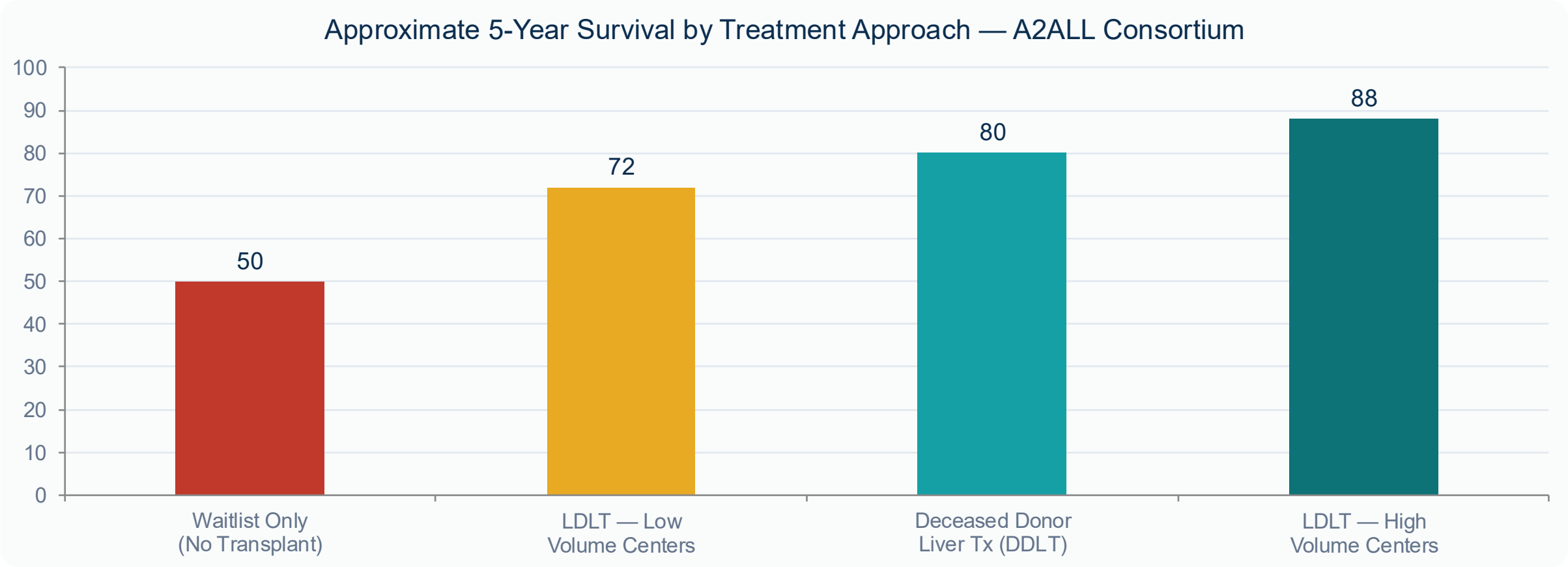
Why This Matters

LDLT avoids waitlist deterioration, reduces ischemia time, and allows elective timing of transplant — key drivers of improved outcomes.

↑ Patient Advantage

LDLT is not just an alternative — it is a performance-enhancing strategy

Survival Outcomes



REALITY: Even at lower-volume centers, LDLT confers meaningful survival benefit over waitlist-only. The right comparison isn't LDLT vs. DDLT — it is LDLT vs. never getting a transplant.

A2ALL Consortium; Cotter TP, Bhatt N, Khandelwal N, et al. Liver Transpl. 2021

M Y T H 4

“Only certain patients qualify – criteria are too restrictive.”

Who Can Be a Recipient? — Broader Than You Think

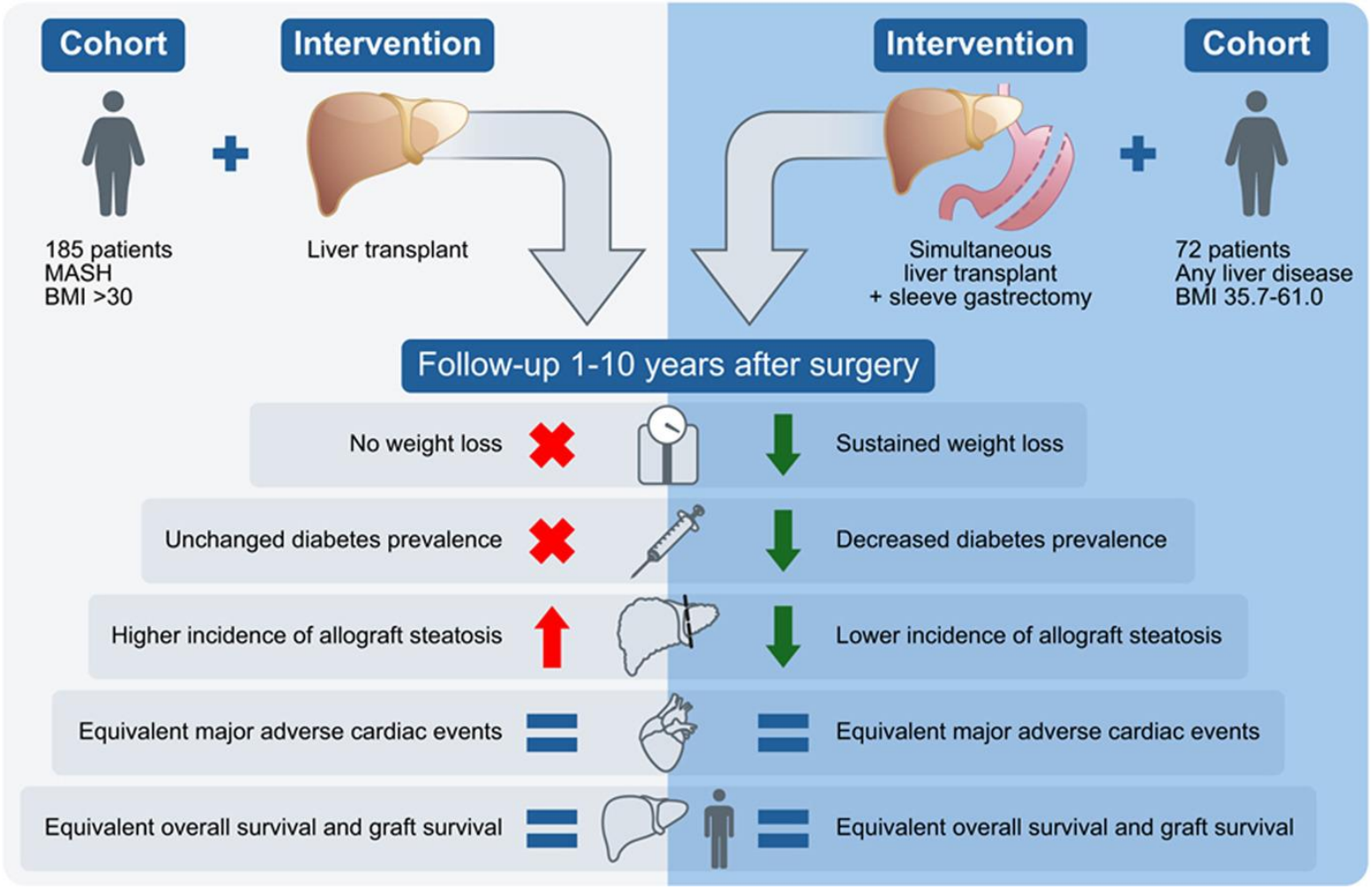
Standard Indications for Liver Transplant in 2023

- Cirrhosis (any etiology) with decompensation
- Alcohol-associated cirrhosis - 34.6%
- MASH - 20.3%
- Other/unknown - 14.7%
- Hepatocellular carcinoma (HCC) - 10.4%
- Cholestatic liver disease (PSC, PBC) - 7.4%
- Alcohol-associated hepatitis - 6.5%
- Hepatitis C - 4.2%
- Acute liver failure - 2.0%

LDLT Advantage by MELD Score	
MELD < 15	Portal HTN complications drive morbidity despite low MELD — LDLT offers a transplant that DDLT allocation won't prioritize
MELD 15–24	Standard benefit from both LDLT and DDLT; LDLT avoids waitlist accrual risk
MELD ≥ 25	High urgency; LDLT provides an immediate option vs. rising waitlist mortality
HCC (any MELD)	LDLT avoids waitlist dropout from tumor progression; oncologic criteria still apply

2023 Waitlist Composition (OPTN/SRTR 2023)

Simultaneous LT and Sleeve Gastrectomy (LTSG)



LTSG

- Significant, sustained weight loss
- ↓ incidence of allograft steatosis
- ↓ prevalence of postoperative diabetes
- ≈ mortality, graft loss, and major cardiovascular events

Ellen L. Larson, Samia D. Ellias, Daniel J. *Journ of Hepatol.* 2025

UHTI Early Experience (LD)LTSG

Methods

Single Center

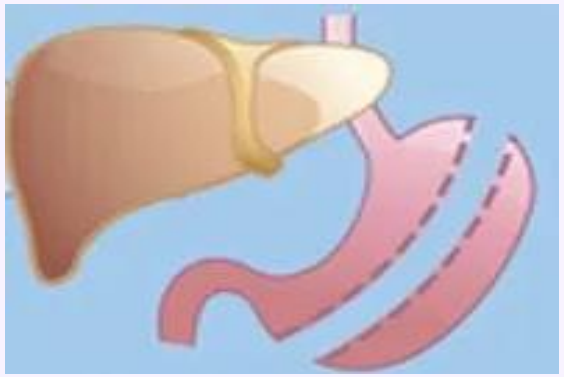
7

Diagnosis MASH cirrhosis

Mean BMI 42.1 (SD 5.8)

Avg MELD 18.6

Intervention



Liver transplant + Sleeve gastrectomy

Dec 2023 – May 2025

Outcomes

15.7% → **26.5%** → **31.3%**

TBWL **1 month** | TBWL **6 months** | TBWL **12 months**

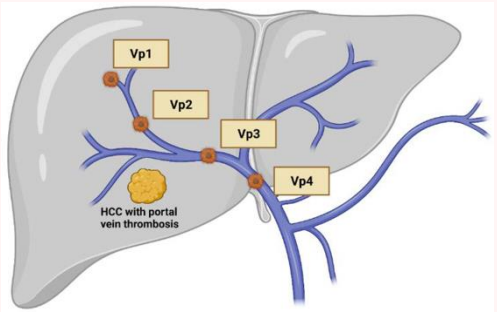
Safety Profile

- ✓ No biliary or vascular complications post-operatively
- ✓ ≈ mortality and graft loss vs. liver transplant alone
- ✓ ↓ allograft steatosis and reduced post-LT diabetes

Patnaik R, Woodworth J, Kempenich J, et al. *Surg Obes Relat Dis*. 2026

LDLT in HCC with Portal Vein Tumor Thrombus

PVTT Classification

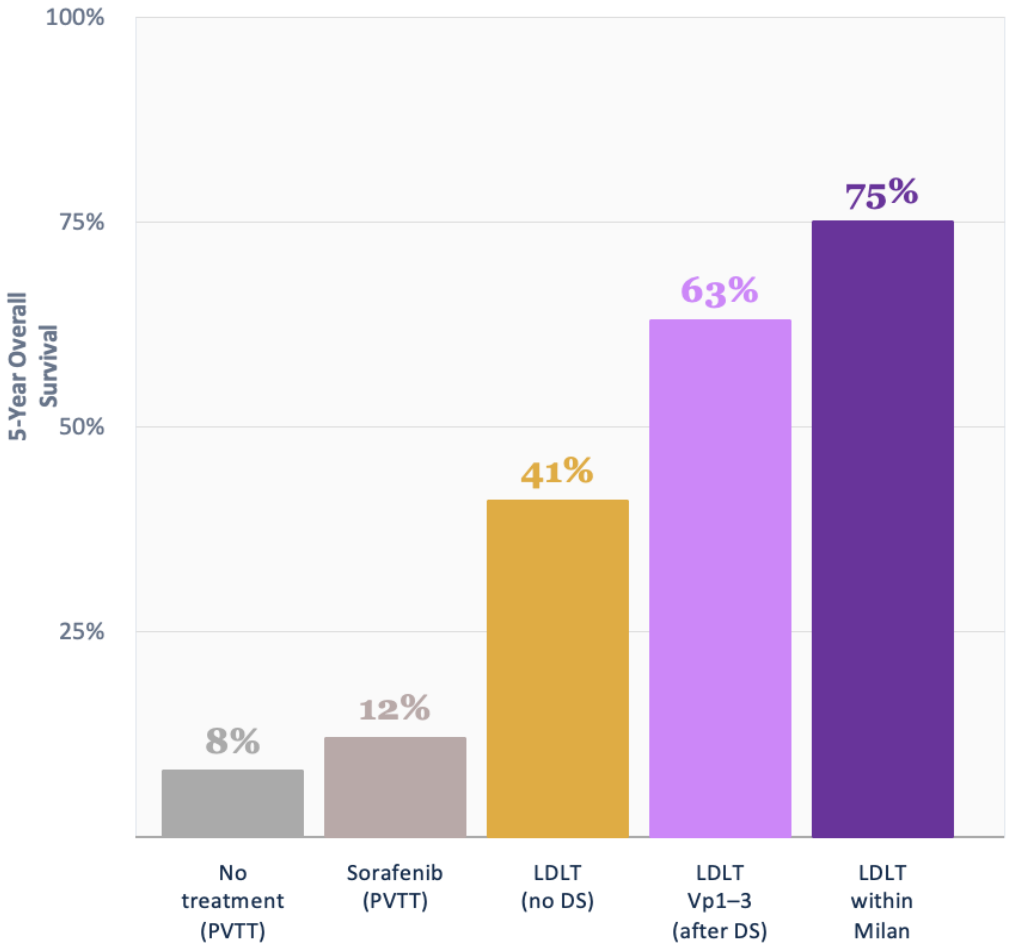


Vp1	Segmental branches
Vp2	Second-order branch
Vp3	First-order branch
Vp4	Main trunk / bilateral

✓ Vp1–3: LDLT after downstaging

✗ Vp4: generally contraindicated

5 Year Overall Survival for HCC + PVTT



Key Evidence

2–6 mo
Median survival without treatment

63%
5-yr OS with LDLT after downstaging

57%
5-yr OS largest single-center

P=0.06

AFP ≤100 + good DS response = survival comparable to Milan

Soin AS, et al. Transplantation. 2020;104(11). | Yu J, et al. Eur J Surg Oncol. 2022. | Meta-analysis: J Hepatol. 2024.

Who Can Be a Donor?–Also, Broader Than You Think

Age	BMI	Relationship
18–55 years (some centers to 60)	≤30–32 kg/m² (center-specific)	Related or unrelated. Altruistic (Good Samaritan) donors accepted.

Blood Type	Liver Volume	Steatosis
Compatible ABO. ABO-incompatible accepted at select US centers.	Future liver remnant ≥30–35% (right lobe)	<10% macrovesicular. Biopsy if steatosis suspected on imaging.

Most common exclusions: Donor reluctance 21%, hepatic steatosis 16%, inadequate remnant volume 13%, psychosocial issues 7%.

~25% of interested donors proceed to surgery. Informed, voluntary consent is non-negotiable — donors may withdraw at any point.

American Liver Foundation 2022; AASLD Guidelines; Emamaullee J, Bourret K, Jadlowiec C, et al. Am J Transplant. 2022

Blood Type Incompatibility

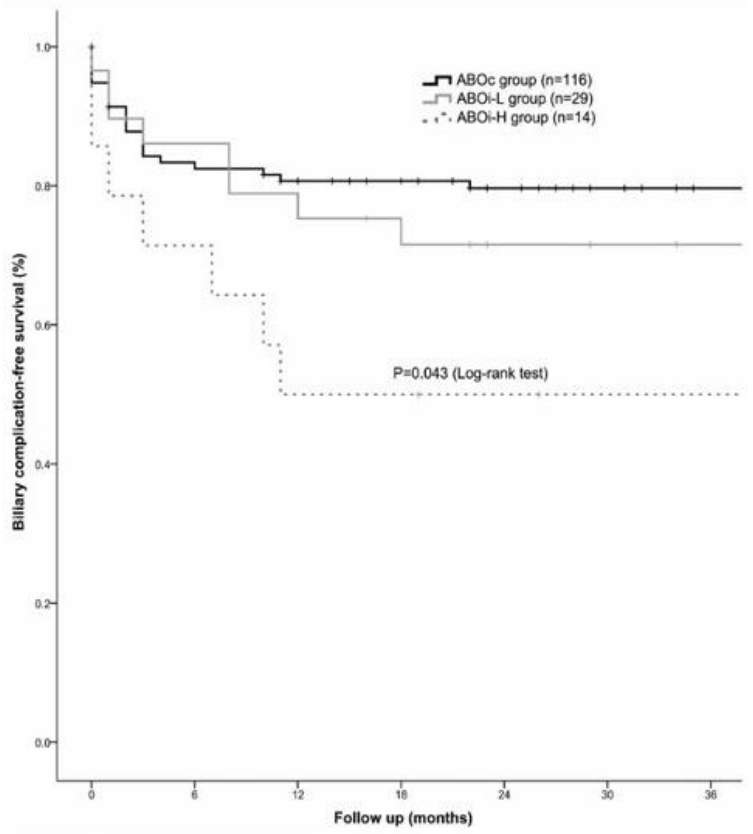
Key outcome signals

- Japanese nationwide survey: 3-year survival improved from ~30% to ~80% after rituximab entered routine use.
- In the 381-adult Japanese registry, AMR fell from 23.5% to 6.2% after rituximab prophylaxis.
- Largest single-center series (n=235, Korea): 3-year graft survival 89.2% and patient survival 92.3% — comparable to ABO-compatible group.
- ABO-I now accounts for ~20% of all LDLT procedures in Asia.
- High baseline anti-ABO titers still matter: high-titer ABOi group had worse biliary complication-free survival (p=0.043)

Bottom line: wrong blood type is no longer "impossible" — but outcomes depend on titers, protocol discipline, and center experience.

ABO-incompatible LDLT: modern results are protocol-dependent

The best data come from Japan and East Asia, where rituximab shifted outcomes substantially.



Exact published figure: biliary-complication-free survival by ABO compatibility / titer group (J Clin Med 2024).

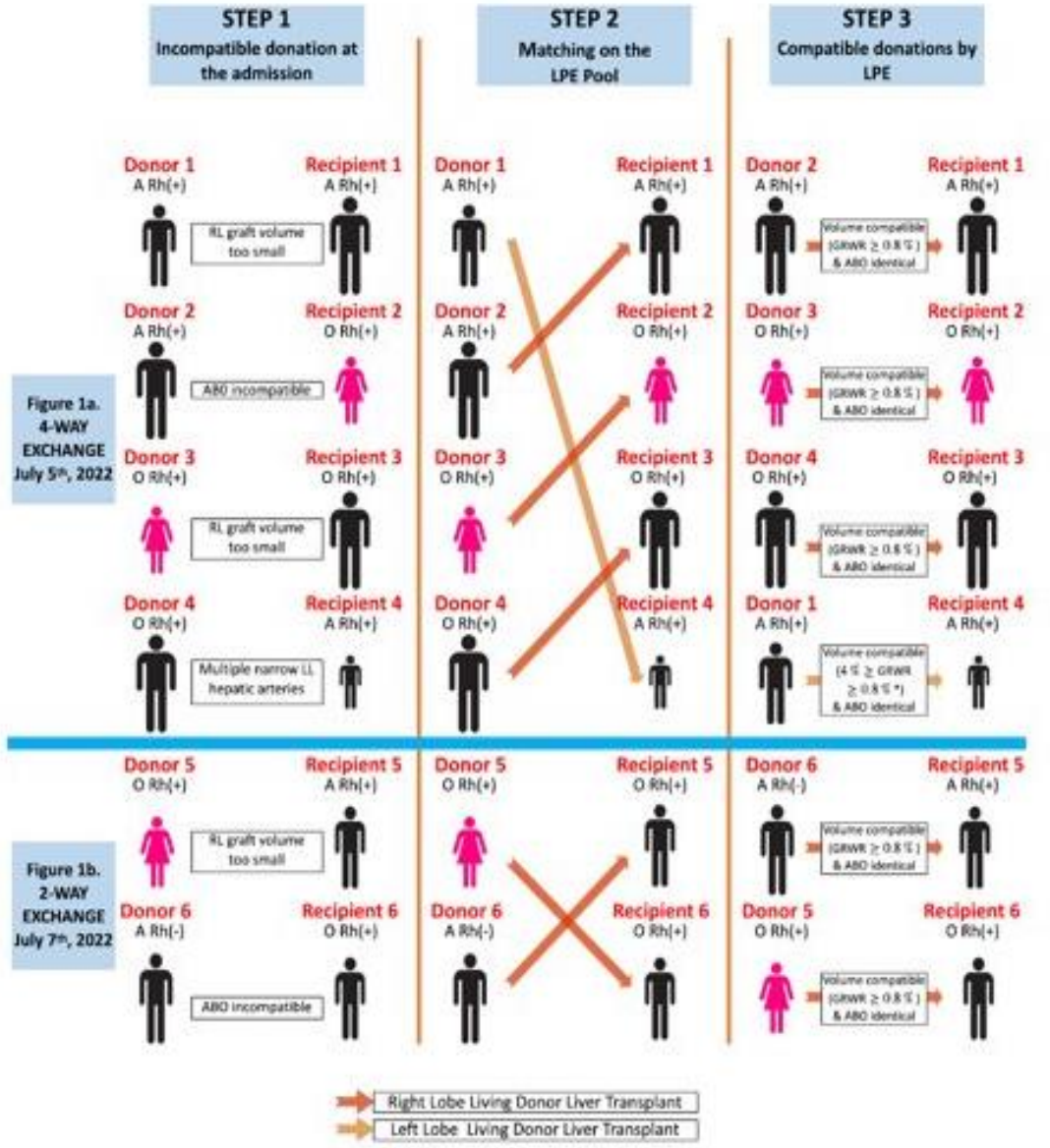
Egawa H, Teramukai S, Haga H, et al. Transplantation. 2014; Raut V, Uemoto S. Am J Transplant. 2015; Current Status ABO-I LT. Transplantation. 2023

Liver Paired Exchange

What the paired-exchange literature shows

- North India 9-year series: 34 of 2340 LDLTs (1.45%) were done as paired exchange for ABO incompatibility; donor survival was 100% and 1-year recipient survival 85.3%.
- A US single-center report described 11 liver paired exchanges from 2019-2023, enabling 23 LDLT pairs at UT Health San Antonio.
- North America has reported donor-initiated domino chains, and Turkey has scaled exchanges up to 5-, 6-, and 7-way chains.

If a willing donor is the wrong blood type, ask about liver paired exchange before concluding the patient has "no donor."

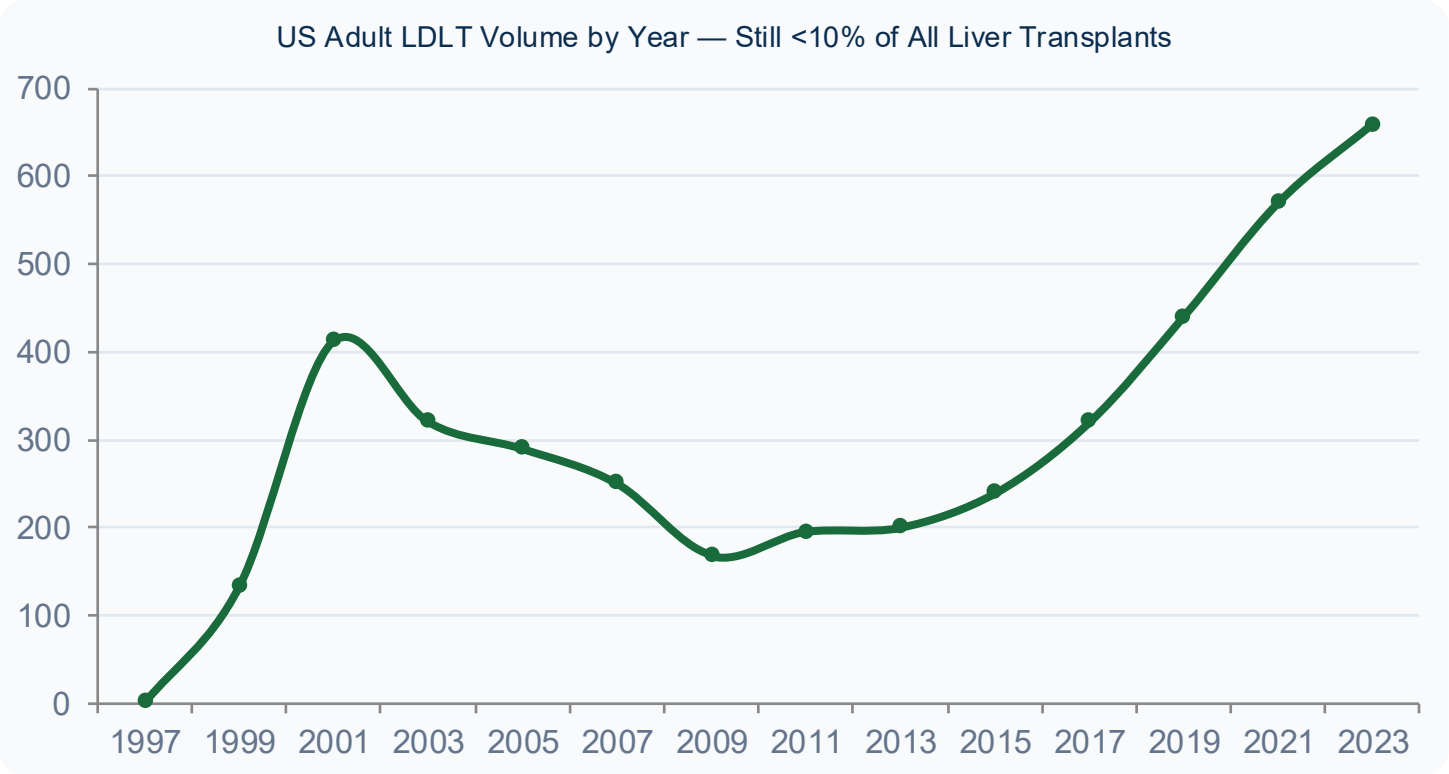


Klair T, Jafri SM, Galiano R, et al. Liver Transpl. 2024;30(10):1013-1025; Klair T, Vachharajani N, Majella Doyle MB, et al. Ann Surg. 2020; Sonmez MG, et al. Am J Transplant. 2023; India 9-yr series. Transplantation. 2022

M Y T H 5

“Finding a living donor is too complicated. That’s not my job”

LDLT is Critically Underutilized



658

Record LDLTs in 2023 — yet only 5.7% of all adult liver transplants

<10%

of all US liver transplants are living donor (vs. >70% in Japan/Korea)

REALITY: LDLT remains critically underutilized in the US. Barriers include lack of clinician awareness, failure to raise the option with patients, and inadequate referral to centers with active LDLT programs.

This is where you come in.

OPTN/SRTR 2023 Annual Data Report. Am J Transplant. 2025; OPTN Press Release 2024; American perspectives for LDLT in 2024. Updates Surg. 2024

What You Can Do Right Now

1

Identify candidates early

Any cirrhotic patient with decompensation (ascites, HE, variceal bleed, HRS, SBP) warrants transplant evaluation — don't wait for MELD ≥15. LDLT can help even low-MELD patients with significant portal HTN.

2

Raise living donation proactively

Many patients never ask. Bringing it up opens the door. Donors can be unrelated — Good Samaritan donors are accepted at most US centers.

3

HCC patients need urgent referral

Tumor progression causes waitlist dropout. Discuss LDLT early, especially if DDLT wait time at your region's center exceeds 6 months.

4

Refer to an active LDLT center

Not all centers perform LDLT. Centers doing >20/year have superior outcomes. Early referral = more time for donor workup.

5

Optimize potential donors

Encourage potential donors with BMI 30–32 to lose weight pre-evaluation. Steatosis is the #2 reason for donor exclusion (16%). Avoid alcohol pre-evaluation.

6

Address misconceptions head-on

Donor mortality is ~1:5000. The liver regenerates in 6–10 weeks. Most donors report high satisfaction and quality of life after donation.

Numbers to Remember

1 in 500

Waitlist patients die or become too sick before transplant

6 weeks

Donor liver fully regenerates after surgery

>80%

5-year patient survival after LDLT exceeds DDLT at 5 yrs

OPTN/SRTR 2023 Annual Data Report. Am J Transplant. 2025; Cotter TP et al. Liver Transpl. 2021; Emamaullee J et al. Am J Transplant. 2022

Reality Behind Every Myth

MYTH 1	The waitlist is NOT fine. 30% of patients die or become too sick. LDLT is a life-saving alternative — not a last resort.
MYTH 2	Donor mortality is ~0.02%. An experienced-center selection matters.
MYTH 3	5-year patient survival after LDLT exceeds DDLT. The right comparison is LDLT vs. never getting a transplant.
MYTH 4	Criteria are broader than perceived. Decompensated cirrhosis at any MELD, HCC, and portal HTN are all indications. Altruistic donors count.
MYTH 5	Early referral, proactive counseling, and identifying donors in your patients' networks saves lives.

Refer your patients early — contact local transplant center's living donor program coordinator.