

Expanding the Donor Pool with Extended Criteria Donation After Circulatory Death Livers



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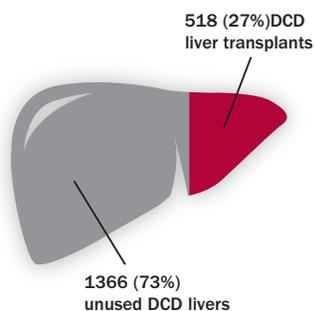
Addressing the shortage of livers for organ transplantation

Across the United States, over 14,000 patients are currently waiting for liver transplantation. Unfortunately, each year only 7,000 – 8,000 livers are donated.¹ In addition, new organ allocation guidelines and underutilization of available organs has made access to organs even more challenging.

Indiana University Health is finding organ access to be a particularly important issue and is addressing this challenge by incorporating new and revised protocols into our liver transplant program, to give even more patients access to this critical, lifesaving surgery. These protocols incorporate greater use of donation after circulatory death (DCD) livers while maintaining strong, positive outcomes.

Why are many transplant programs reluctant to use DCD livers?

Like any other intervention, DCD liver transplantation (DCD LT) was initially associated with poor outcomes. Several transplant programs published results indicating that DCD LT can be associated with intrahepatic biliary strictures and graft loss. This led to overall lack of enthusiasm with using these livers. Although the number of DCD donors has doubled in the last decade, only 27% of DCD livers in the United States were transplanted in 2017.¹



IU Health optimization protocol

In 2011, an optimization protocol was introduced at IU Health to improve outcomes of DCD liver transplantation. Briefly, this protocol consisted of short ischemic times and use of thrombolytic donor flush.



Indiana University Health

Outcomes of DCD liver transplants at IU Health

Since the optimization protocol was implemented in 2011, 75 patients have received DCD liver transplants. Clinical outcomes for our patients have significantly improved, with none of our patients developing intrahepatic biliary strictures. Additionally, our 1-year graft survival rate has improved from 79% to 94%. Results of this initiative show patient survival rates comparable to deceased donor LT (Figure 1).

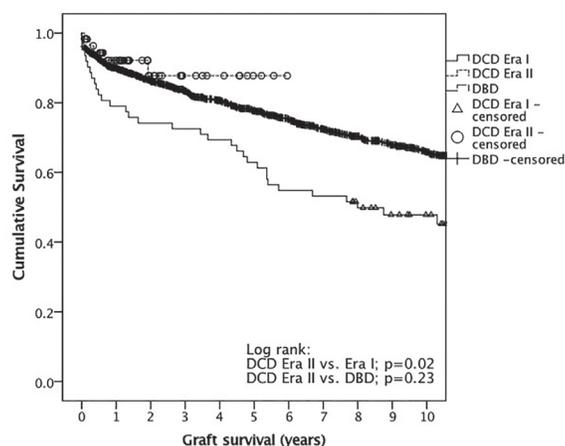
DCD liver transplant graft survival

Figure 1. Graft survival for DCD liver transplants compared across two Eras and also with deceased donor liver transplants ($p=0.02$).

Encouraged by our initial success, we expanded this program to use extended criteria donor (ECD) DCD livers in 2017.

Livers are considered ECD DCD livers if one of the following factors are present:

- Donor age > 50 years
- Donor BMI 35 kg/m²
- Donor functional warm ischemia time (fWIT) >30 minutes



- Donor liver macrosteatosis > 30%

After institution of the optimization protocol, we have transplanted 38 ECD DCD livers, accounting for 52% of our DCD volume.

The use of ECD DCD livers was not associated with intrahepatic biliary strictures or increased graft loss (Table 1).

ECD variable/s	Era I (n=24)		Era II (n=38)	
	Transplants	Graft loss (%)	Transplants	Graft loss (%)
Age >50	8	6 (75)	23	1 (4)
BMI >35	4	1 (25)	7	0
fWIT >30	8	4 (50)	6	0
Macrosteatosis >30%	0	0	6	1 (17)
Age >50 + BMI >35	3	3 (100)	1	0
Age >50 + fWIT >30	0	0	1	0
Age >50 + Macrosteatosis >30%	0	0	2	0
BMI >35 + fWIT >30	1	0	1	0
BMI >35 + Macrosteatosis >30%	0	0	0	0
fWIT >30 + Macrosteatosis >30%	0	0	1	0

Table 1. Extended criteria DCD livers and graft loss

Legend: Data are presented as the frequency of transplants and graft loss (%); Age in years; BMI in kg/m²; fWIT in minutes. ECD: extended criteria donor; fWIT: functional donor warm ischemia time.

With the expansion of the DCD donor pool, the number of DCD liver transplants performed at IU Health has increased to account for >10% of our program's liver transplant volumes. Since 2016, ECD DCD donors constituted >50% of our DCD LT activity (Figure 2).

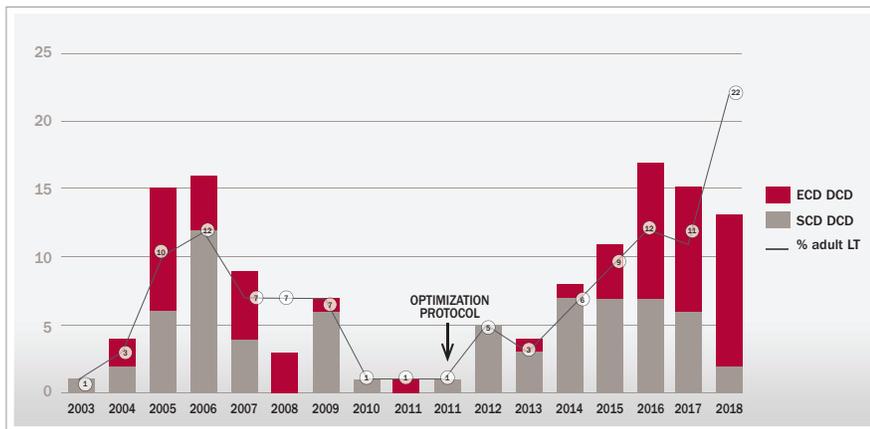


Figure 2. Number of DCD LTs performed at Indiana University Health since 2003

Gray bars indicate standard criteria donor (SCD) DCD donor LT. Black bars indicate ECD DCD LT. The numbers indicate percentages of all adult LTs of each year performed at Indiana University. The DCD LT optimization protocol was introduced in July 2011. Data for 2018 are subject to change.

Conclusion

Use of ECD DCD livers, along with optimization of perioperative conditions, is now helping create greater organ availability and allowing IU Health to expand its access to donor livers for transplant patients. As one of the top 5 liver transplant programs in the country as ranked by volume, our goal is to ensure that all available organs are transplanted to the most suitable candidates with the best possible outcomes.¹

Contact IU Health

To refer a patient or discuss the program, contact our dedicated physician liaison, Amy Miller Wozniak, awozniak@iuhealth.org or 463.224.4133.

Reference:

1. US Department of Health and Human Services. <https://optn.transplant.hrsa.gov/>.