

it may also be worth reconsidering national borders in organ allocation—as using lungs across borders may be beneficial to the transplant community as a whole.

Reference

1. Cypel M, Yeung J, Donahoe L, Yasufuku K, Pietroski R, Lange P, et al. Outcomes of lung transplantation at a Canadian center using donors declined in the United States. *J Thorac Cardiovasc Surg.* 2022;164:1661-8.e1.

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Commentary: A sobering reality: Donor lungs declined in the United States transplanted successfully in Canada

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Cypel and colleagues¹ present their experience with lung transplantation using donor lungs that were declined by centers in the United States and then offered to their center in Ontario, Canada. Over a 10-year period (from 2009 to 2019), 124 patients underwent lung transplantation using these organs. During the same period, they performed 1300 transplants using lungs from direct offers from Canadian centers. The percentage of transplanted patients with lungs from an American donor increased from 5% to 15% over this time. Their results are very compelling, showing similar short- and long-term outcomes, similar incidence of primary graft dysfunction and chronic lung allograft dysfunction, and similar need for extracorporeal membrane oxygenation after lung transplantation when comparing recipients of lungs from a Canadian center with recipients of lungs from an American center.

In their study, donors from the United States were younger and more commonly hepatitis C virus-positive by nucleic acid testing than Canadian donors. Ex vivo lung



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CENTRAL MESSAGE

Lungs declined in the United States were transplanted in Canada with acceptable outcomes. We need to better understand the reasons for declining lungs to increase the organ pool in the United States.

perfusion (EVLP) was used more frequently in lungs from American donors (46% vs 27%), despite similar lung function among the American donors and Canadian donors at the time of procurement. This is not surprising given the extensive center experience of the Toronto group with EVLP. The reasons for higher use of EVLP in lungs from American donors are not specified, but this study also suggests that EVLP and reconditioning may ameliorate lung injury in some cases and allow transplantation from donors previously deemed unsuitable, as previously published by the authors.^{2,3} Despite the frequent use of EVLP, it is also notable that 54% of the lungs from donors in the United States were transplanted directly, with overall preservation times >10 hours. This highlights that adequately recovered and preserved donated lungs can tolerate long ischemic times without adverse outcomes.

According to the Organ Procurement and Transplantation Network/Scientific Registry of Transplant Recipients 2019 Annual Data Report, the number of lung transplants performed continues to increase annually and

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reached an all-time high in 2019.⁴ The number of lung transplants performed in the United States in 2019 increased by 7.6% compared with the year prior. Waitlist mortality is decreasing due to ongoing scientific and policy efforts to increase the number of lung donors that have led to a remarkable 62% increase in donors over the past decade. Overall pretransplant mortality among adults waitlisted for lung transplant was 14.6% in 2019, an important accomplishment given the increasingly older and sicker candidate population. Nonetheless, despite this improvement, mortality while waiting for a lung transplant continues to be high and should make us reflect on our practices.

The reasons for the nonutilization of organs in the United States are mainly related to real or perceived poor organ quality, and there are likely logistical issues considering frequent requests for an expedited offer due to family requests or donor instability. Unfortunately, no information was available as to why the lungs transplanted in Ontario, Canada, were declined by centers in the United States. We need to better understand the reasons for declining these lungs and reevaluate ways to optimize donor evaluation and intraoperative management, EVLP, and procurement logistics at centers in the United States to increase the currently available pool of donor lungs. The United Network for Organ Sharing and Organ Procurement and Transplantation Network have recently implemented a new policy of listing the reasons for organ refusal, which should increase our understanding of why organs are declined for transplant. It is unclear whether or not implementation of

these organ procurement organization performance metrics in the near future will modify the efficiency of procurement in the United States and decrease the export of organs.

The authors note and we agree that the availability of a high-performance EVLP program at their center prompted American organ procurement organizations to send offers more liberally to their program. The dedication and maturity of their transplant team with early implementation of lung donation after cardiac death and the use of hepatitis C virus-positive donors ahead of many centers in the United States likely increased offers as well.

We congratulate the Toronto team for their excellent results and thank them for sharing their strategies to increase utilization of donated lungs. Their results highlight that adequately recovered and preserved donor lungs can tolerate long ischemic times without adverse outcomes and should be used to maximize the current available donor pool in the United States.

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