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Commentary: Lung donation after circulatory death in the United States. Current and future challenges

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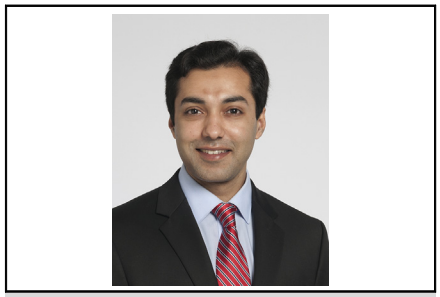

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CENTRAL MESSAGE

Lung donation from DCD remains low. Variability in practice exists across regions and programs. Increasing awareness and standardization is necessary to preserve and expand this donor pool.

In the early and mid-2000s, reports of lung allograft donation after circulatory death (DCD) and their successful usage created some much needed enthusiasm and hope that the organ shortage could be mitigated to some extent.[1-3] The Toronto lung transplant program reported the use of DCD lungs had increased from 0% in 2006 to 27% in 2008.[4] In addition, 36 DCD lungs were transplanted in the United States from 1987 to 2007.[5] These, as well as more recent data reported by the International Society of Heart and Lung Transplantation, showed reasonable recipient 5-year survival that was comparable to the survival after transplantation with lungs from brain dead donors (DBDs).[6] Despite these findings and the continued discrepancy between the number of available organs and the number of listed patients, a surprising amount of apprehension has continued to surround the use of DCD lungs by transplant programs and the organ procurement organizations (OPOs).

Some of the technical and logistic issues surrounding the use of DCD lungs continue to be a challenge in increasing the adoption of DCD practice. For example, the greater uncertainty of a dry run, an inability to thoroughly assess the organs intraoperatively before procurement, an inability to recruit and monitor gas exchange in real-time, and the time constraints imposed by DCD donation have decreased the appeal of DCD donation and procurement. Identifying additional preprocurement factors that might predispose a donor to either not be approached or allocated is important to modify practice and help increase donor usage.

Choi and colleagues[7] have undertaken this timely study to evaluate the risk factors for the nonusage of lungs from DCD donors. During a 15-year period, 15,458 DCD donors (30,916 lungs) were evaluated; however, only 3.7% were used for clinical transplantation. This is in stark contrast to 22.4% of lungs from DBDs being used during the same period. The vast proportion of organs in each group were just not recovered (DCD, 73%; DBD, 63%). The donor factors associated with the nonuse of DCD lungs included a low arterial/inhaled oxygen ratio, a history of smoking, and older age.

Parsing through the reasons for nonusage revealed that consent had not been obtained for 4.6% of DCD and 2.6% of DBD cases. It is very interesting to note, however, that consent was not requested for 8.4% of DCD donors compared with only 2.2% of DBD donors, highlighting differences in OPO practices and, perhaps, perceptions. On a similar note, regional differences in DCD donation were also noted. Among these findings, the practice of not approaching donor families for consent appears to be the most readily modifiable factor. This missed opportunity could potentially have added close to 100 (at a 3.7% transplantation rate) lungs to the DCD donor lung pool during the study period. This is a remarkable finding that opens up avenues for improving education and changing perceptions at the OPO level. It is important to note that a

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significant share of this responsibility lies with the local transplant centers.

In the United States, we are entering a unique era in which supportive technologies such as ex vivo lung perfusion will allow transplant programs to evaluate DCDs, extended criteria, or marginal organs for extended periods, potentially overcoming some of these logistic issues and increasing the number of available transplantable organs. However, at the same time, newer allocation policies such as the replacement of the donation service area with a 250-nautical mile radius are expected to decrease traditional "local" donations, increase travel distances and costs, and potentially decrease the appeal for programs to evaluate donors with uncertain outcomes such as DCD. Fortunately, the 2-year outcomes have shown an increase in the total number of DCDs in the post-policy change era with regional variability.[8] Remarkably, regions 7, 9, and 10, which are identified by Choi and colleagues[7] to have higher DCD usage, were noted to all have an increased number of patients on the waiting list after the donation service area change, along with a greater number of overall transplants. The long-term effects could be different if financial constraints become more prominent.

As I write this commentary, the world is struggling with the ravages of the coronavirus disease 2019 viral pandemic. All transplant activity has significantly slowed, if not come to a screeching halt, at disease epicenters. To help sustain essential transplant activity, all major transplant organizations have recommended local procurement to decrease long distance travel to donor hospitals, especially across state borders. In this situation, the acceptance of DCD donors could very well decrease even more, given the addition of an extra layer of uncertainty and/or lack of a suitable local procurement team.

To add insult to injury, the US Centers for Medicare and Medicaid Services has proposed new standards that will require OPOs to stay close to or above the 75th percentile (among OPOs) in both organ donation and organ transplantation rates.[9] This could force OPOs to prefer donors and organs with a greater chance of acceptance for transplantation and could pose additional challenges to DCD lung donation and usage.

The importance of this work in understanding the factors associated with DCD nonusage cannot be overstated. Transplant centers need to appreciate these challenges and the rate-limiting steps surrounding organ availability. I would like to reiterate the importance of building a strong partnership with OPOs to change perceptions, increase awareness, and, perhaps, eventually narrow the supply demand gap in lung transplantation.

Significant variability in practice exists among various programs and regions. Programs accept a varying level of "risk," depending on the program's comfort level and perhaps based on the severity of recipient illness. Standardization of at least some practices such as the length of agonal time, a broader use of ex vivo lung perfusion, and a broader sharing of procurement resources could also allow transplant centers across the United States to use more DCD donors.

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