Lungs from older donors may provide a breath of fresh air to patients awaiting lung transplant

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Only 15% to 20% of donated lungs are transplanted because of infections, contusions, or other abnormalities, and mortality while waiting for a lung transplant continues to be high, ranging from 10% to 15%.¹⁻⁴ To increase the number of lungs available, the standard donor criteria have been expanded liberally by many experienced transplant centers.⁵ Donor age more than 55 years is considered an extended criterion. Acceptance of lungs from older donors has been limited by findings that suggest an increased risk of early graft dysfunction, decreased graft durability and long-term function, impaired healing with secondary fibrosis, increased susceptibility to certain cancers and infections, and age-dependent alterations in immune function with lungs from older donors.⁶

In their current study, Holley and colleagues⁷ examined the effects of donor age on lung transplant outcomes. The single-center study provides deeper insight into conflicting data regarding the use of older donors in lung transplantation and includes a relatively large number of older donors. It also includes analysis of donor age as a continuous variable, which is notable. The authors retrospectively reviewed 882 lung transplants performed between 1986 and 2016 and correlated donor age with outcomes, including survival, bronchiolitis obliterans syndrome (BOS), and primary graft dysfunction, both before and after the adoption of the lung allocation score. In the lung allocation score era, survival and freedom from BOS 5-year post-transplant was not significantly different when 3 donor age groups (age <40, 40-54, and >55 years, defined a priori) were examined, and no interaction was observed between the donor age and the risk of severe primary graft dysfunction. After adjusting for comorbidities, donor age as a continuous variable also had no effect on 5-year mortality (or even on 10-year mortality!). The authors conclude that long-term survival of lung transplant recipients was not affected by the age of the donor, which supports the notion that the donor-age criteria can be expanded.

Central Message

As described in this issue of the *Journal*, using lungs from donors aged more than 55 years may be reasonable to expand the organ pool for transplant. Future studies should address the upper age limit for lung donors.

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Some previous studies support the findings of Holley and colleagues.⁷ An analysis of lung transplant outcomes with older donors in the late 1990s, which primarily examined donors aged 50 to 55 years, did not find a clear relationship between donor age and early mortality post-transplant, but identified a potentially negative effect of older donors on intermediate- and long-term survival, particularly when combined with increased organ ischemic time.^{8,9} More recent reports of donors aged 55 years or more have shown favorable short-term and midterm survival and functional outcomes.¹⁰⁻¹² De Perrot and colleagues¹¹ found that lungs from donors aged more than 60 years may be used with no difference in early outcomes, but cautioned that using these lungs in high-risk recipients (eg, those with pulmonary hypertension or pulmonary fibrosis) may be associated with lower 10-year survival and increased rates of BOS.

Other recent evidence suggests that some lungs from donors aged more than 70 years may be safely used. Sommer and colleagues¹³ showed no significant survival difference 1-year post-transplant in 27 recipients without pulmonary hypertension or idiopathic pulmonary fibrosis who received lungs from donors aged more than 70 years when the lungs were preselected for smoking status, oxygenation index, and the absence of opacities on chest radiographs. However, in a recent United Network of Organ Sharing analysis of 104 patients by Bittle and colleagues,¹⁴ which was corroborated by Baldwin and colleagues,⁶ donor age more than

65 years was associated with decreased early and intermediate survival with survival.

Holley and colleagues⁷ current study confirms that accepting lungs from donors aged more than 55 years is a safe and effective way to increase donor use and that age per se should not be automatically considered a contraindication for lung use. This is an important message. However, another crucial question remains unanswered because of the limited number of donors aged more than 60 years in this study: How old can a donor be? Further studies are needed to determine an acceptable upper limit of the donor age criteria for lung transplantation.

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