

# Extracorporeal membrane oxygenation as a bridge to lung transplantation

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Extracorporeal membrane oxygenation (ECMO) support in awake, non-intubated patients may be an effective strategy for bridging patients to lung transplantation, according to a new study from Germany.

"As waiting times for donor organs continue to increase, so does the need for bridging strategies for [patients](#) with end-stage lung disease awaiting transplantation," said Marius M. Hoeper, MD, professor of medicine at the Hannover Medical School in Hannover, Germany. "Our study shows that ECMO support in awake and non-intubated patients may be an alternative to intubation and mechanical ventilation, and may result in better survival."

The findings were published online ahead of print publication in the American Thoracic Society's *American Journal of Respiratory and [Critical Care Medicine](#)*.

In the retrospective, single-center study of consecutive lung transplantation candidates with terminal respiratory or cardiopulmonary failure, 26 patients received awake ECMO and 34 control patients received conventional mechanical ventilation (MV) as a bridge to transplant. Median duration of ECMO support was 9 days (range 1-45) and median duration of MV was 15 days (range 1-71). Veno-arterial ECMO was used primarily in patients with right ventricular failure and/or profound hypoxemia while the veno-venous approach was used primarily in patients exhibiting hypoxemic and/or hypercapnic [respiratory failure](#) but stable hemodynamics.

Of 26 patients in the ECMO group, six (23%) died before a [donor organ](#) became available, compared with 10 of 34 (29%) patients in the MV group. Among the patients who reached transplantation, the survival rate at six months post-transplantation was significantly ( $p=.02$ ) higher in the awake ECMO group (80%) compared with the MV group

(50%). The six-month survival rate among awake ECMO patients who required secondary intubation dropped to 43%. Awake ECMO patients required significantly ( $p=.04$ ) shorter postoperative mechanical ventilation and showed a trend towards shorter postoperative hospital stays.

ECMO-related complications included a fatal cardiac arrest after insertion of the venous ECMO cannulae in one patient. Intubation and mechanical ventilation was required 1-7 days after ECMO insertion in six patients. Blood transfusions due to bleeding complications were needed in eight patients. Of five patients who developed a sepsis-like syndrome, one recovered.

"Ours is the largest series of patients who underwent awake ECMO as a bridge to lung transplantation," said lead author Thomas Fuehner, MD. "In addition to the possibility that this approach may improve survival, one of the main benefits of using awake ECMO is the avoidance of the complications associated with general anesthesia, intubation, and long-term ventilation."

The study had a few limitations, including the small number of patients included and the retrospective nature of the analyses. "Awake ECMO may be an effective bridging strategy for [lung transplantation](#) candidates," said Dr. Hoeper. "This strategy, however, remains investigational and must be studied further to improve its safety and efficacy and examine how to tailor its use for specific patient populations."

Provided by American Thoracic Society

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