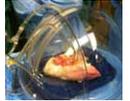


After a clinical trial to increase the number of donor lungs, transplant patient goes home. In a new trial at UCH, surgeons actually remove a lung so they can make a more informed decision about its viability for transplant. If successful, the procedure could double the number of lungs available for transplant, and shorten waiting lists.



Shortening the waiting list?

An Out-of-Body Experience in Transplants Aims to Double Number of Donor Lungs

By Tyler Smith

University of Colorado Hospital is part of a Phase I clinical trial that could eventually help to increase significantly the pool of available donor lungs for transplant.

The 18-month trial, which began in August, tests the safety of a procedure called ex-vivo lung perfusion (EVLP). In it, clinicians remove the potential donor lung from the donor's body, and keep it alive for up to 12 hours by circulating oxygenated fluid through it. The idea: get a better, longer look to identify lungs suitable for donation that, using standard technology, providers might have rejected.

Associate Professor of Cardiothoracic Surgery Michael Weyant, MD, performed the first procedure late last month. The patient who received the donor lung went home Sept. 29, and is recovering smoothly, Weyant said (*see accompanying story in this issue*).

Fragile supplies. If the technique proves successful, EVLP could double the number of donor lungs, he noted. That's especially important because the supply of lungs available to patients on lengthy transplant waiting lists is as fragile as the organs themselves. Worldwide, only about 15 percent of all available lungs are accepted for transplant. By comparison, more than 90 percent of kidneys can be used in transplants, Weyant said.

"The shortage is dire," Weyant said. "Our main goal in the trial is to prove that this technique is safe and replicates our current standard of success with lung transplant, which would therefore increase the donor pool significantly."

A bigger supply of lungs, of course, would mean more lifesaving transplants. Weyant said EVLP potentially could increase the 25 to 30 lung transplants now performed each year at UCH to 50 or 60.



Weyant says the EVLP procedure could double the number of lungs available for transplant.

The challenge for lung transplantation specialists is the lungs themselves, Weyant explained. The environment, ventilators, physical injury, and brain death can all severely damage a lung's delicate tissue and make it unusable for transplants.

Closer look. Traditionally, clinicians evaluate a lung by measuring the partial pressure of oxygen in arterial blood (PaO₂) and taking x-ray images to look for scarring and trauma.

Continued

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Bringing the lung outside the body allows surgeons to get a better look at it and make a more informed decision about its viability, Weyant noted.

“We can look at the entire surface and feel it with our fingers to assess the consistency of the lung,” he said.

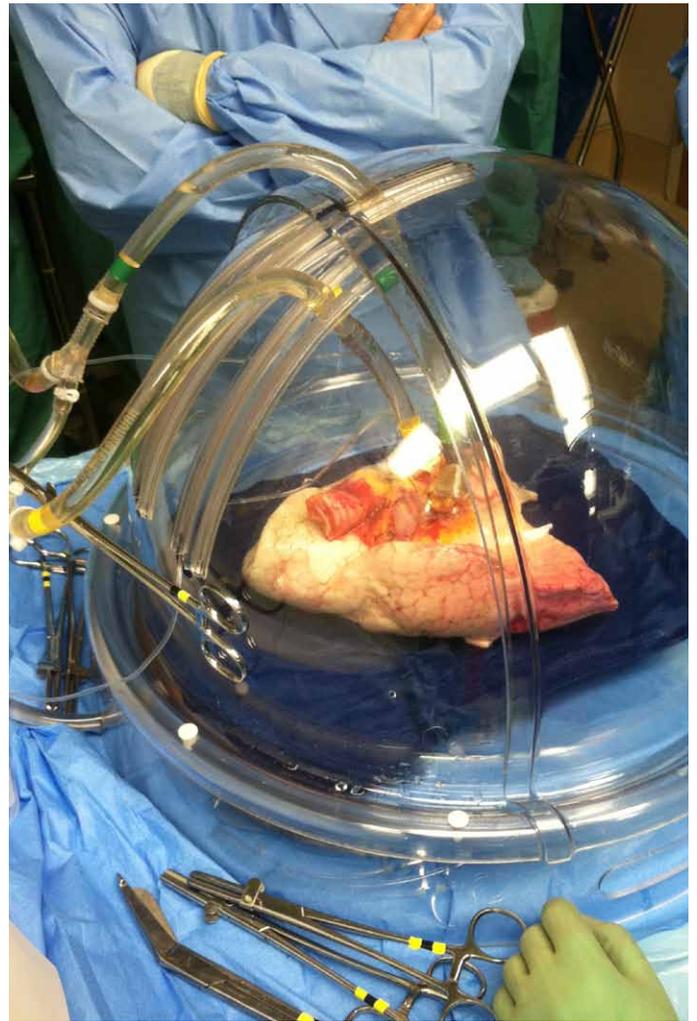
Clinicians keep the lung alive by hooking it up to a ventilator, then circulating a solution through a centrifugal pump. They use the solution to measure the lung’s ability to transmit oxygen.

Weyant said the EVLP technique can keep a lung alive up to 12 hours, significantly longer than the six to eight hours a surgical team typically has before the tissue dies using standard preservation methods. The precious extra hours, he noted, “could increase our geographic range to procure organs. If we can keep the lung alive longer, we have more time to match organs with specific tests.”

Success for the participating centers would be that 30-day mortality rates for EVLP patients are no worse than those who have standard procedures. “We want to demonstrate a proof-of-principle so other [transplant centers] will start it,” Weyant said.

Looking forward, he said, EVLP holds additional promise. For example, it could be used to treat damaged lungs or to provide gene therapy to protect the donor organ from rejection.

But for now, Weyant is thrilled by the prospect of a procedure that can help identify more lungs for transplant. “It is great to be able to do something that is on the cutting edge,” he said. “Doing it was as good as simply being able to do [transplants] for a living.”



Ex-vivo lung is ventilated and perfused with a non-blood, oxygen-carrying solution.