

MEDICAL BREAKTHROUGHS **RESEARCH SUMMARY**

TOPIC: NEW AND IMPROVED DONATED LUNGS
REPORT: MB #4756

BACKGROUND: A lung transplant surgery occurs when a diseased lung needs to be replaced with a healthy lung from another person. Transplant becomes a viable option when a patient has a serious complication like cystic fibrosis, COPD, or pulmonary fibrosis that cannot be treated in any other way and the patient has a life expectancy of 12 to 24 months without a transplant. This procedure is done on patients of all ages ranging from infants to seniors. There are multiple types of lung transplant procedures such as single and double lung, taking out one or both lungs respectively. Bilateral sequential or bilateral single, meaning removing both lungs at the same time and heart-lung transplant which involves transplanting both lungs and the heart from one person to another. Most commonly, lungs are transplanted from deceased organ donors. However, it is also possible for healthy, living individuals to transplant a portion of their lung, or a lobe, to another person and still live a normal life with the remaining lung.

(Source: <https://www.hopkinsmedicine.org/health/treatment-tests-and-therapies/lung-transplant>)

TRANSPLANT LIST: A new name is added to the transplant list every ten minutes. On average, 20 people die every day waiting for a new organ and there are currently 1,189 people on the waiting list for lungs in the United States. For example, only 42 percent of cystic fibrosis patients received donated lungs viable for transplant between 2003 and 2006 and there were still 1,079 patients waiting. Often, even when donor lungs become available, they are not usable enough to warrant a successful transplant. Due to this discrepancy, thousands of people can't get the lifesaving organs they need. In 2011 through 2014, after waiting a year, with 1,216 people still remaining on the list, only 63.7 percent of patients received a lung transplant. In 2016, 221 lungs were deemed "unsuitable" for transplant due to "disease, injury to the organ, and the lapse of too much time between recovery and transplantation," according to a 2017 report from the National Academies of Sciences, Engineering, and Medicine.

(Source: <https://www.americantransplantfoundation.org/about-transplant/facts-and-myths/>, <https://optn.transplant.hrsa.gov/data/view-data-reports/national-data/#>, <https://www.nap.edu/read/24884/chapter/3#36>, <https://www.tmc.edu/news/2019/06/bioengineered-lungs-how-long-from-pigs-to-people/>)

NEW TECHNOLOGY: A new technique, called ex vivo lung perfusion, or EVLP, aims to expand the availability of suitable donor lungs and shorten patient wait times. In the United States alone, 1,600-1,800 lung transplants are performed each year, with many patients dying prior to organs becoming available for them. And, nearly 80 percent of lungs cannot be used. Traditionally, organs have been put in cold storage after procurement where a lot of damage and degradation can occur. By performing ex vivo lung perfusion, the lungs are kept alive outside the body with high oxygen and fluids flowing through them. This prevents the damage and degradation caused by cold storage. The Cleveland Clinic initiated EVLP research activity in 2011 in the McCurry lab and investigated 50 rejected donor lungs. Ex vivo lung perfusion is meeting the high demand for utilizing as high of a percentage as possible of one of the rarest and most desired organs on the transplant list.

(Source: <https://consultqd.clevelandclinic.org/increasing-transplantable-donor-lungs-ex-vivo-lung-perfusion/>, <https://www.upmc.com/services/transplant/lung/process/surgery/ex-vivo-lung-perfusion>)

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If this story or any other Ivanhoe story has impacted your life or prompted you or someone you know to seek or change treatments, please let us know by contacting Marjorie Bekaert Thomas at mthomas@ivanhoe.com

