

Use of methods to protect lungs after brain death increases number of lungs suitable for donation

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Use of certain measures for lung preservation after brain death in potential organ donors resulted in a nearly doubling of lungs eligible for donation, compared to a conventional strategy that is used, according to preliminary research published in the December 15 issue of *JAMA*.

Of patients with relatively normal pulmonary function at the time of brain death, only 15 percent to 20 percent of these patients' lungs are subsequently suitable for transplantation, which may be the result in part from the ventilatory strategy used after brain death. There is controversy as to the best ventilatory strategy to use in these situations, according to background information in the article.

Luciana Mascia, M.D., Ph.D., of San Giovanni Battista Molinette Hospital, University of Turin, Italy, and colleagues conducted a study to examine whether a protective lung strategy in patients diagnosed as having brain death would decrease the development of lung dysfunction and increase the number of lungs available for transplantation. The [randomized controlled trial](#) was conducted at 12 European intensive care units from September 2004 to May 2009. Potential donors were randomized to the conventional ventilatory strategy or the protective ventilatory strategy, with this strategy including several differences such as use of lower tidal volumes (the volume of air inhaled and exhaled at each breath) and higher positive end-expiratory pressure levels (increasing the air pressure in the lungs and air passages near the end of

expiration so that an increased amount of air remains in the lungs following expiration). The trial was stopped after enrolling 118 patients (59 in the conventional ventilatory strategy and 59 in the protective ventilatory strategy) because of termination of funding.

The researchers found that the number of patients in the conventional strategy who met lung donor eligibility criteria at the end of the 6-hour observation period was 32 (54 percent) compared with 56 (95 percent) in the protective strategy. The number of patients in whom lungs were harvested was 16 (27 percent) in the conventional strategy compared with 32 (54 percent) in the protective strategy. Further analyses showed that donor eligibility at the end of the 6-hour observation period was associated with the protective strategy and with use of vasoactive drugs (an agent that causes constriction or dilation of blood vessels) at randomization.

"The median [midpoint] intensive care unit length of stay for patients who received lungs from donors in the conventional strategy was 12 days compared with 8 days for patients who received lungs from donors in the protective strategy. The 6-month survival rate was 69 percent (11/16) for patients who received lungs from donors in the conventional strategy compared with 75 percent (24/32) for patients who received lungs from donors in the protective strategy," the authors write. They add that the number of other organs harvested (hearts, livers and kidneys) did not differ between the 2 groups.

"In conclusion, our results suggest that the use of a lung protective strategy prevents the decline of [pulmonary function](#) consequent to brain death and roughly doubled the number of lungs available for transplantation."

More information: *JAMA*. 2010;304[23]:2620-2627.

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