

# 'Life support' for transplant livers better than freezing: study

April 18 2018, by Mari  tte Le Roux

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A doctor carries a transplant kidney during surgery at Johns Hopkins Hospital in Baltimore, Maryland.

Keeping transplant livers on "life support" at body temperature preserves them better than the prevailing method of near-freezing, and could

reduce the number of donor organs thrown away, a study said Wednesday.

Currently most [donor](#) livers are stored in an inert state at temperatures just above freezing until they can be transferred to a recipient.

But many end up damaged, meaning that only a portion of livers harvested for transplant get used despite an urgent, and growing, organ shortage.

"Approximately one in five patients died on the UK [liver](#) transplant waiting list last year, whilst, paradoxically, almost 500 livers from deceased organ donors were not... transplanted," study co-author Constantin Coussios of the University of Oxford told AFP.

"This was because the suboptimal condition of many [donor organs](#) is such that these are unlikely to work after being preserved in an ice box. Despite many advances in liver transplantation, the method of organ preservation has scarcely changed in 30 years."

A newer method called normothermic machine perfusion (NMP) uses a machine to pump blood through the liver at 37 degrees Celsius (98,6 degrees Fahrenheit)—the [human body temperature](#).

The technique keeps the liver functioning artificially while feeding it oxygenated blood, medicine, and nutrients.

But scientists did not know if it actually works better than the prevailing method, prompting the first-ever study to compare the warm and cold liver storage methods.

Coussios and a team studied what happened to two sets of [donor livers](#)—100 stored on ice, another 120 with NMP, and published their

findings in the science journal *Nature*.

The NMP livers, the authors found, had 50 percent less "graft injury" than the near-frozen organs, and could be kept for considerably longer.

## **Liver is 'a patient'**

More of the NMP livers than could be transplanted.

The number of livers retrieved from donors but rejected after storage "was reduced by 50 percent," said Coussios.

By keeping it functioning artificially, NMP allowed for easier assessment of liver quality than was possible with a near-frozen, hypothermic organ, he said—a sort of pre-surgery "test drive".

The team concluded that widespread use of NMP could cut the number of people who die waiting for a transplant while harvested organs are discarded.

The first NMP device, dubbed OrganOx, was trademarked in 2016, and has started to be used in Europe, India, and Canada, said Coussios.

One of the study authors is a former chief executive of OrganOx Limited, and Coussios is its technical director.

In a comment also carried by *Nature*, Stefan Schneeberger of the Innsbruck Medical University in Austria said the team made a "convincing case" for the effectiveness of NMP, which he said treats the liver "like a patient."

"It is perfused, monitored, and fed by a machine. If it performs well, it is transplanted immediately; if not, it might undergo treatment,

modification or repair before transplantation."

The long-term effects of NMP must be studied before it can be concluded to be a more effective and suitable [method](#) for organ storage, Schneeberger added.

Coussios said further study is needed into the cost-effectiveness of the technology.

**More information:** A randomized trial of normothermic preservation in liver transplantation, *Nature* (2018).

[nature.com/articles/doi:10.1038/s41586-018-0047-9](https://doi.org/10.1038/s41586-018-0047-9)

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