

Nitric oxide does not improve babies' recovery after heart surgery

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Congenital heart disease affects about one in a hundred live-born children.
Credit: Kinderspital Zürich

Congenital heart disease affects about one in a hundred live-born children. In the US alone, about 40,000 children are born with congenital heart disease every year. About half of these patients require heart surgery during the first years of life. This type of surgery involves performing a cardiopulmonary bypass, or artificial heart-lung machine,

that is needed to allow surgeons to operate on the heart.

However, this machine can cause severe inflammation in the [children](#), which may last up to several days after surgery. This inflammation is harmful to the patients, as it weakens the heart and may result in organ dysfunction and the need for ventilation in the ICU. To reduce these side effects, the addition of nitric oxide to the heart-lung machine has been discussed as a promising approach.

No difference in ventilation needs

Researchers at the University of Zurich, the University Children's Hospital Zurich and the University of Queensland (Australia) have now investigated whether the addition of nitric oxide to artificial heart-lung machines reduces infants' need for ventilation after surgery. "The [randomized trial](#) involved 1,371 children across six pediatric heart surgery centers in Australia, New Zealand and the Netherlands," says lead author Luregn Schlapbach from the University Children's Hospital Zurich.

Published in *JAMA*, the findings show no difference in the ventilation needs of study participants who received nitric oxide and those who did not after heart surgery. The study authors thus conclude that the use of nitric oxide in cardiopulmonary bypass surgery does not improve the recovery of children following [heart surgery](#).

The trial was the largest interventional study in children with [congenital heart disease](#) performed to date. "Researchers will now analyze gene activation patterns in the study participants to find out which biological processes could be targeted in the future—including in terms of precision medicine," says Schlapbach. A follow-up study of the cohort into school age will also be conducted to understand the true long-term impact of [nitric oxide](#) gas intervention.

More information: Luregn J. Schlapbach et al, Effect of Nitric Oxide via Cardiopulmonary Bypass on Ventilator-Free Days in Young Children Undergoing Congenital Heart Disease Surgery, *JAMA* (2022). [DOI: 10.1001/jama.2022.9376](https://doi.org/10.1001/jama.2022.9376)

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