

# **Downsizing is not enough: Minimal Invasive Extracorporeal Circulation is more than just a Circuit**

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## Reply to the editor

We appreciate the opportunity to respond to Dr Condello<sup>1</sup> based on our randomized controlled trial of minimal invasive versus standard extracorporeal circulation (ECC) in aortic valve surgery with respect to blood loss<sup>2</sup>.

As discussed by Dr. Condello, changing aspects of ECC alone is not enough to improve patient outcomes.

The consensus statement by the Minimal invasive Extra-Corporeal Technologies international Society (MiECTiS) refers to minimal invasive extracorporeal circulation (MiECC) as “a combined strategy of surgical approach, anaesthesiological and perfusion management and should not be limited to the cardiopulmonary bypass circuit alone”<sup>3</sup>. Indeed, close team work among trained surgeons, perfusionists and anesthesiologists is fundamental to improve results when using a MiECC.

Contrary to what affirmed by Dr Condello several studies and meta-analyses<sup>4</sup> compared MiECC to conventional ECC (CECC) with the inclusion of a wide range of both CECC and MiECC systems. Examples of modular differences are summarized in Table 5 of our paper<sup>2</sup>.

Our study is among the first ones to compare a modern, modified ECC equipped with a centrifugal pump (MiECTiS-type IV-like) to a MiECC (MiECTiS type II)<sup>2</sup>. Here, we showed that a MiECC has a small advantage in blood loss and preservation of hemoglobin levels compared to a modern MiECTiS-type IV-like ECC. No improvements in survival or transfusion were found. Centers without MiECC can still benefit from modular improvements to reduce the systemic inflammatory response and blood loss but a motivated team is fundamental to switch to a modern ECC.

We are looking forward to the ongoing COMICS trial which compares CECC to MiECC in 3500 patients<sup>5</sup>. Results are expected in 2021, yet they will not give a definitive answer to all questions. Components as a standard oxygenator, roller pump, hard-cell reservoir, shed-blood suctions, and uncoated tubing are allowed in the CECC group. Coated elements and centrifugal pumps can however be integrated in the CECC group. Interesting results are to be expected from subgroup analyses of these more advanced CECC in comparison to MiECC.

We still do not have evidence to establish the best setup for a modern ECC with respect to improving patient outcomes. Downsizing alone is not enough: MiECC is a joint effort of circuit optimization and team effort.

## References

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