

## #ISICEM19: Adrenaline is here to stay



**Samna Ghani**

\*\*\*\*\*@\*\*\*healthmanagement.org

Managing Editor - ICU  
Management & Practice  
Senior Editor -  
HealthManagement.org

[Twitter](#)

At the [39th International Symposium on Intensive Care and Emergency Medicine](#) in Brussels, Belgium, [Professor Jerry Nolan](#) discussed the role of adrenaline. He highlighted that there are many observational studies out there that suggested that the use of adrenaline [epinephrine], while it increased the return of spontaneous circulation (ROSC), seemed to be associated with survival with increased worse neurological outcomes.

He explained that these observational studies drove PARAMEDIC-2 (Prehospital Assessment of the Role of Adrenaline: Measuring the Effectiveness of Drug Administration in Cardiac Arrest), the first large, randomised, placebo-controlled trial, which was published last year. Over 8000 patients with out-of-hospital cardiac arrest (OHCA) were recruited in this trial. Patients were administered either parenteral epinephrine or placebo by paramedics alongside standard care.

The primary outcome of the study was the rate of survival at 30 days. Secondary outcomes included the rate of survival until hospital admission, the length of stay in the hospital and the ICU, the rate of survival at discharge and at 3 months, and the neurological outcomes at hospital discharge and at 3 months.

As per the results of the study, 3.2% of the patients in the epinephrine group were alive at 30 days compared to 2.4% in the placebo group. Prof. Nolan pointed out that these might seem dreadful survival rates, but it is important to remember that this was a subgroup of patients that did not get resuscitation. No significant difference was observed between [the epinephrine group and the placebo group](#) among patients who survived until hospital discharge.

Severe neurologic impairment was more common among survivors in the epinephrine group compared to the placebo group. But survival at 3 months and neurological outcomes at 3 months were similar in both groups. In addition, there were no significant differences between the two groups in terms of length of stay in the hospital or ICU. The return of spontaneous circulation rate was three times higher with the use of adrenaline. Therefore, it is evident that the previous observational studies have underplayed the benefit of adrenaline in terms of ROSC. Overall in terms of neurological outcomes at 30 days at discharge, the results are still favouring adrenaline.

Prof. Nolan said that it is also important to consider patient flow because that tells the story in a slightly more informative way. There is a huge difference in the number of patients, not just arriving at the hospital alive, but getting into the ICU. There is a big dropout rate between the ICU and the ward, which suggests that many of the patients who received adrenaline died in the ICU.

This presents an ethical challenge in some respect. He mentioned that one of the many secondary analysis is to look at the economics of this and tie that in with organ donation rates. It is important to evaluate the resources being used on patients that subsequently die. Maybe those patients become organ donors as this is one of the most cost-effective interventions that could be implemented.

Overall, findings of the PARAMEDIC-2 trial clearly show that adrenaline or epinephrine is here to stay. There is a need to determine the right dose of adrenaline, and we should be open to the idea of maybe giving a lower, more frequent dose. This needs to be further researched, but

overall adrenaline is not going anywhere, concludes Prof. Nolan.

Source: Prof. Nolan's presentation live coverage; [NEJM](#)

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