To the Editor:

We read with great interest the article by Zhang and colleagues1: a single-center experience showing that although 48.8% of all extracorporeal membrane oxygenation (ECMO) patients are successfully decannulated and survive for 30 days or until discharge, 44.5% of patients die while on support or in the following 30 days, and 6.7% are bridged to advanced heart failure therapies.

This study highlights once again the presence of the so-called ECMO gap: the discrepancy between patients who are successfully weaned from ECMO and patients who survive to discharge. This concept has been previously investigated by our groups.2 We demonstrated that many published series do not discriminate death occurring during or after support. Furthermore, we showed that 15.3% of all patients receiving venoarterial ECMO die after initially successful weaning. Our groups also described the ECMO gap within the postcardiotomy population, a group of patients that is also represented in the study by Zhang and colleagues.1 Through single- or multicenter investigations, we showed that 23% to 36% of patient receiving postcardiotomy ECMO die despite initially successful weaning. The study by Zhang and colleagues1 confirms the above-mentioned concepts but also highlights the compelling need for a universal definition of successful weaning and ECMO gap. Indeed, Zhang and colleagues considered all cases of death within 30 days from decannulation as unsuccessful weaning. However, within 30 days, many ECMO-unrelated complications can occur and lead to death. We therefore question whether it is accurate to consider all 30-day deaths to be directly caused by an unsuccessful weaning.

In several studies, successful weaning describes patients who survive 24 to 48 hours after decannulation.4 However, such a death might or might not be strictly correlated to the previous support, or to its withdrawal. Conversely, other studies define unsuccessful weaning as decannulation without a new ECMO run, durable assist device implantation, or transplant within 30 days from weaning. Hence, they all include an indicator of heart failure in the definition. Moreover, in the article by Zhang and colleagues’ those patients who died in hospital but after 30 days from decannulation are considered successfully decannulated, but they still contribute to the ECMO gap.

It is thus necessary to identify a unique definition for successful weaning and clearly describe the events leading to a subsequent complicated hospital course. Both of these concepts should be added to the ECMO nomenclature to avoid misleading conclusions. They should be applied and reported in each study, and used to identify factors causing postweaning mortality, and its preventive or therapeutic measures. This and other inconsistencies make it impossible to draw valid conclusions. Moreover, every meta-analysis or review on the topic is doomed to fail.

In conclusion, there is still a huge knowledge gap regarding what happens after decannulation (Figure 1), and we will not solve it unless we find a way to speak a common language.

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Conflict of Interest Statement

Dr Lorusso is a consultant for Medtronic-Getinge-Abiomed-LivaNova and an advisory board member of Eurossets-Hemocue-Xenios (honoraria as research funding). Dr Wiedemann is a consultant/proctor for Abbott and a scientific advisor for Xenios. All other authors reported no conflicts of interest.

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References


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