Reviewer's report

Title: Evaluation of the PaO2/FiO2 ratio after cardiac surgery as predictor of outcome during hospital stay.

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Reviewer: Matthias Eikermann

Reviewer's report:

The authors determined the optimal cut-off values of PaO2/FiO2 ratio to predict mortality in patients after cardiac surgery. The authors found that P/F ratio time-point 3 h after the case provided the best predictive value for mortality - expectedly, the uni-dimensional model was still inferior to dedicated mortality prediction instruments such as APACHE or SAPS.

Major points:

1. The authors should make a better point as to whether or not mortality prediction based on a variable that describes the function of a single organ is important. Naturally, mortality prediction based on multiple variables will always be better. Why focusing on P/F ratio and not APACHE score or vasopressor requirement and/or urinary output? Why should a clinician use P/F ratio for mortality prediction?

2. The statistical methods need to be described in more detail, and the language used for making this description needs to be improved. I request that the paper will be assessed by a statistician.

3. The esteemed authors should invite a native English speaking medical scientist to revised their paper. Example: First sentence of discussion "This study shows the importance and meaning of PaO2/FiO2 ratio for prognosis at the postoperative period of cardiac surgery, being evaluated from cost-minimization criterion not used before." I am also not sure what a "cost minimization criterion" means.

4. The P/F ratio groups differ in their characteristics, and it is unclear to me if P/F ratio or for example rather the PEEP or cross clamping time (which both differed between groups) were the more important mortality predictor.

5. Table 5: What does "multivariate analysis" mean?

6. I would like to understand if P/F ratio explains variance of mortality independent of known predictors of mortality. I would be happy if the authors would present their a-priori-defined model used for confounder control.

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Not suitable for publication unless extensively edited
**Statistical review:** Yes, but I do not feel adequately qualified to assess the statistics.

**Declaration of competing interests:**

none.