**Reviewer’s report**

**Title:** Tissue oxygen saturation as an early indicator of delayed lactate clearance after cardiac surgery: A prospective observational study

**Version:** 0  **Date:** 10 Aug 2015

**Reviewer:** Erik K. Hartmann

**Reviewer's report:**

Kopp et al. present an observational study that uses NIRS to monitor peripheral tissue oxygenation in cardiac surgery patients. The authors show that an early minimum StO2 < 75% immediately after surgery reliably indicates an impaired lactate clearance up until day 1 and was further associated with higher troponine and CK-MB levels. The study is of interest for anesthesiologist as well as intensive care physicians and adds information to the current discussion about the role of NIRS in perioperative care. The manuscript is well written, the data presentation and analysis is adequate. The limitations (observational design, smaller sample number) are sufficiently stated.

There are some minor issues that author should clarify:

Please specify the fluid administration routine (type, amounts) to exclude cofounding effects. Where there any (particularly intraoperative) differences in fluid administration in patients presenting with StO2 < 75% vs. >75% at T0. Did the authors use perioperative transesophageal echocardiography to assess fluid demand or myocardial contractility?

I miss some statements regarding the signal quality, artefacts, or measurement failure. Please add.

Please also discuss the StO2 measurement in the mucosal (i.e. sublingual, buccal) v.s. transcutaneous (i.e. thenar) microcirculation in this context.

The authors twice mention the SOFA score, though without reporting any data. Please report the score values.

The authors measured StO2 different oxygen delivery conditions (FiO2 ranging from 1.0 and 0.3). Considerably different oxygen levels may secondary influence StO2.

This may have influenced the StO2. Please also report PaO2 values and discuss.

Line 50: Which test was used for correction of multiple testing?

**Are the methods appropriate and well described?**

If not, please specify what is required in your comments to the authors.
Yes

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

Yes

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

Yes

Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I am able to assess the statistics

Quality of written English
Please indicate the quality of language in the manuscript:

Acceptable

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