Reviewer's report

Title: Mechanisms of pulmonary dysfunction after on-pump and off-pump cardiac surgery: a prospective study

Version: 1 Date: 4 November 2006

Reviewer: Wolfgang Buhre

Reviewer's report:

General
In their study Groeneveld et al. describe the effects of on- versus off-pump surgery on pulmonary dysfunction. The manuscript is well written and the topic is of interest for physicians involved in the care of cardiac surgical patients.

Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached)
The authors should describe if they performed a power analysis, because the number of patients in the on-pump group is quite small. Moreover, the groups cannot directly compared as some important issue like temperature management differ. This may lead to a different haemodynamic response in the perioperative period.
In my opinion, there is some overinterpretation of results, as conclusions cannot necessarily be drawn from some a small number of patients.
The authors should comment on that issue.
Do the authors think that the different surgical approach (two open pleura in the off-pump group) versus at least only one pleurotomy in some of the on-pump patients has influenced their results.

Page 7: in some pats, central venous instead of mixed venous blood was used, why this?

Results: P. 8 "Lung mechanics and ...", what does this mean?
There was a wide range in PLI after on-pump surgery (7-73), is there an relation between duration of CPB and PLI,
was there a difference in the PLI in COPD patients compared to patients without CPB

Discussion: I would suggest to change the first sentence of the discussion chapter instead of pump perfusion the authors should write CPB

I do not agree that lower temperature per se explains the lower O2 demand, as it is known that warming can result in higher O2 demand.
ITBV values varied within groups, is this a possible explanation for the changing haemodynamics. In other words are some patients are hypovolaemic

Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)

Patients and Methods:
This chapter can be shortened

Discretionary Revisions (which the author can choose to ignore)

What next?: Unable to decide on acceptance or rejection until the authors have responded to the major compulsory revisions

Level of interest: An article of importance in its field

Quality of written English: Acceptable
Statistical review: No, the manuscript does not need to be seen by a statistician.