Author’s response to reviews

Title: A simple clinical model for planning transfusion quantities in heart surgery

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I now submit our latest research study regarding the development and the evaluation of a simple clinical model for planning transfusion quantities in heart surgery. This study arose from the need to improve conservation strategy and optimize the administration of blood products in critical patients.

The model developed in the submitted study used a dummy-variable linear-regression approach in a sample of 3315 consecutive heart surgery patients, where the size of transfused and not-transfused samples was sufficiently large.

The model selected eight preoperative and two intraoperative independent dummy variables to be interpreted as factors for PRBC request. Specifically, the occurrence of each model factor (dummy value equal to 1) could be accounted for adding a number of PRBC equal to the corresponding regression coefficient rounded to its the nearest half unit, so that transfusion needs could be planned promptly and easily, patient-by-patient.

Good agreement was obtained between model output and our standards. In fact, when patients managed with transfusion therapy at variance with our blood conservation strategy and those with unforeseeable adverse events associated with surgery were removed from the sample, the percentage of cases in which the model estimate and actual number of packs transfused differed by more than two was only about 7%.

In conclusion, although further validation is necessary, the results clearly seem indicate that the present modelling approach enables design of a useful decision system for planning transfusion needs a priori in most heart surgery situations.