

Corrected version:

In the validation cohort, POSPOM score equal to 30 (*i.e.*, predicted in-hospital mortality = 7.40%) was associated with an observed in-hospital mortality of 6.74% (95% CI, 6.40 to 7.08%). The distribution of POSPOM and the associated observed in-hospital mortality in the validation cohort are shown in figure 3. POSPOM values less than or equal to 20 were associated with a probability of in-hospital mortality less than or equal to 0.04% (*i.e.*, less than the in-hospital mortality observed in the full population—the average risk); a POSPOM value of 25 equates to a probability of in-hospital mortality of 1.73% (*i.e.*, about three times the average risk), and POSPOM values between 30 and 40 equate to a probability of in-hospital mortality of 11.77% (*i.e.*, 20 times the average risk).

Reference

Le Manach Y, Collins G, Rodseth R, Le Bihan-Benjamin C, Biccard B, Riou B, Devereaux PJ, Landais P: Preoperative score to predict postoperative mortality (POSPOM): Derivation and validation. *ANESTHESIOLOGY* 2016; 124:570–9

In Cerebral Oximetry, Do We Trust?

To the Editor:

We read with a great interest the recent publication by Deschamps *et al.*¹ for the Canadian Perioperative Anesthesia Clinical Trials Group. While the results of this randomized controlled study are quite encouraging and further highlight both the feasibility and the potential clinical utility of cerebral oximetry in the setting of cardiac surgery, several concerns should be outlined.

First, the authors proposed a well-known algorithm to be used in the operating theater in order to reverse a cerebral desaturation below 10% relative to baseline. This notably low threshold value differs from those previously recommended and used by the same authors and others.² Interestingly, an extracranial contamination affecting near-infrared spectroscopy measurements of cerebral oxygen saturation beyond 10% has been reported in healthy volunteers for at least two of the three near-infrared spectroscopy devices used in the current study.³ This last point could be of paramount importance and should be cleared up before conducting a large multicenter randomized controlled trial aiming to demonstrate a positive impact of preventing and treating cerebral desaturation on perioperative outcomes in high-risk surgical patients.

Second, the proposed algorithm suggests the early correction of intraoperative hypotension. Besides, the assessment of cardiac function and optimization of cardiac output occur only as a second-line treatment. That seems quite questionable, as low flow states could be significantly correlated with cerebral oxygenation in cardiac surgery, regardless of systemic arterial pressure.⁴ In contrast, a decrease in pressure could not affect cerebral oxygen saturation.⁴ Moreover, phenylephrine and norepinephrine administration in order to correct hypotension have been associated with a further decrease in cerebral oxygenation.^{4,5}

Third, no difference was found in adverse events between the intervention and control groups in the study by Deschamps *et al.*,¹ even if cerebral oximetry was far better preserved in patients randomized to intervention than routine care. Of course, we agree that the study was not designed to demonstrate such a positive impact on perioperative outcomes and that a large-scale multicenter randomized study is mandatory to answer that crucial issue. However, it is noteworthy that the current multicenter study including up to 201 patients was unable to confirm previous results reported by Murkin *et al.*⁶ in a randomized, prospective, and single-center study also including 200 patients, using a similar algorithm, and showing a significant reduction in major organ dysfunction in the intervention group ($P = 0.048$). Again, the definition of the targeted threshold value of cerebral oximetry initiating clinical interventions is probably crucial.

In conclusion, we share the same enthusiasm as that of the authors regarding the potential interest of noninvasive cerebral oximetry in cardiac surgery. While waiting for a large, multicenter, randomized controlled trial definitely showing a benefit on meaningful clinical perioperative outcomes, we need to be cautious before recommending a wider use of this kind of monitoring in the setting of cardiac surgery.

Competing Interests

The authors declare no competing interests.

Jean-Luc Fellahi, M.D., Ph.D., Philippe Portran, M.D.
Hôpital Cardiologique Louis Pradel, Lyon, France (J.-L.F.).
jean-luc.fellahi@chu-lyon.fr

References

1. Deschamps A, Hall R, Grocott H, Mazer CD, Choi PT, Turgeon AF, de Medicis E, Bussièrès JS, Hudson C, Syed S, Seal D, Herd S, Lambert J, Denault A, for the Canadian Perioperative Anesthesia Clinical Trials Group: Cerebral oximetry monitoring to maintain normal cerebral oxygen saturation during high-risk cardiac surgery: A randomized controlled feasibility trial. *ANESTHESIOLOGY* 2016; 124:826–36
2. Denault A, Deschamps A, Murkin JM: A proposed algorithm for the intraoperative use of cerebral near-infrared spectroscopy. *Semin Cardiothorac Vasc Anesth* 2007; 11:274–81
3. Davie SN, Grocott HP: Impact of extracranial contamination on regional cerebral oxygen saturation: A comparison of three cerebral oximetry technologies. *ANESTHESIOLOGY* 2012; 116:834–40
4. Moerman A, Denys W, De Somer F, Wouters PF, De Hert SG: Influence of variations in systemic blood flow and pressure on cerebral and systemic oxygen saturation in cardiopulmonary bypass patients. *Br J Anaesth* 2013; 111:619–26
5. Sørensen H, Secher NH, Siebenmann C, Nielsen HB, Kohl-Bareis M, Lundby C, Rasmussen P: Cutaneous vasoconstriction affects near-infrared spectroscopy determined cerebral oxygen saturation during administration of norepinephrine. *ANESTHESIOLOGY* 2012; 117:263–70
6. Murkin JM, Adams SJ, Novick RJ, Quantz M, Bainbridge D, Iglesias I, Cleland A, Schaefer B, Irwin B, Fox S: Monitoring brain oxygen saturation during coronary bypass surgery: A randomized, prospective study. *Anesth Analg* 2007; 104:51–8

(Accepted for publication June 21, 2016.)