(Bright) future of dynamic parameters is in the operating theatre

Editor—In their article about the applicability of pulse pressure variation (PPV), Mahjoub and colleagues concluded that ‘a very low percentage of patients satisfied all criteria for valid use of PPV’. Importantly, the study was done in intensive care unit (ICU) patients. As a result, and not surprisingly, 49% were not mechanically ventilated, 25% were mechanically ventilated but kept a spontaneous breathing activity, and 12% had cardiac arrhythmias (the incidence of arrhythmia being higher in ICU patients than in the general population).

Assuming the same evaluation had been done in patients undergoing major surgery, all patients would have been mechanically ventilated without any spontaneous breathing activity and around 1% would have had atrial fibrillation (the incidence in the general population). In this regard, we can reasonably assume that the same study done in the operating theatre instead of the ICU would have concluded that PPV can be used in around 85% of the cases.

I fully agree with Mahjoub and colleagues that dynamic parameters have limitations which are frequently encountered in ICU patients. In another recent article on the same topic, Benes and colleagues showed that dynamic parameters were usable only in 51% of ICU patients admitted for polytrauma, 37% of patients admitted for sepsis, and 33% after surgery.

Interestingly, most common limitations vanish in patients undergoing major surgery so that dynamic parameters can be used and recommended to guide fluid therapy in this setting. And this is very fortunate since, over the last few years, at least eight randomized controlled trials have demonstrated that intraoperative fluid management based on the monitoring and optimization of dynamic parameters (PPV or stroke volume variation) allows a significant reduction in post-surgical complications and hospital length of stay.

The future of dynamic parameters is bright, but mainly in the operating theatre!

Declaration of interest

F.M. is a Vice-President, Global Medical Strategy, at Edwards Lifesciences. Of note, the above statements do not support the use of any specific medical device.

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Dynamic parameters in the operating theatre: brightness goes with shadows

Reply from the authors

Editor—We thank Michard and Benes for their fruitful comment about our article. They emphasize the fact that the majority of pulse pressure variation (ΔPP) limitations in the intensive care unit (ICU) vanish in patients undergoing major surgery in the operating theatre (OT), mainly because the OT is a more controlled environment than the ICU regarding mechanical ventilation. We fully agree with the fact that all patients in this environment were mechanically ventilated without any breathing activity and that the incidence of arrhythmia in this population is far lower than in the ICU. However, some limitations persist in the OT and others may appear. First, recently published data showed that decreasing tidal volume < 8 ml kg−1 enhances patients’ clinical outcomes during major abdominal surgery and thus should be implemented in the management protocols of patients undergoing major surgery. This level of tidal volume is one of the limitations of ΔPP as it increases the number of false-negatives. Second, an increased intra-abdominal pressure impedes the ability of ΔPPs to predict fluid responsiveness. This situation may happen during laparoscopic surgery. Thirdly, opening the chest, the