

## **Pleth variability index versus pulse pressure variation for intraoperative goal-directed fluid therapy in patients undergoing low-to-moderate risk abdominal surgery: a randomized controlled trial**

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### Background

Goal-directed fluid therapy (GDFT) based on dynamic indicators of fluid responsiveness has been shown to decrease postoperative complications and hospital length of stay (LOS) in patients undergoing major abdominal surgery. The usefulness of this approach still needs to be clarified in low-to-moderate risk abdominal surgery. Both pulse-pressure variation (PPV) and pleth variability index (PVI) can be used to guide GDFT strategies. The objective of this prospective randomized controlled trial was to determine if the use of PVI guided GDFT, when compared to PPV guided GDFT, would lead to similar hospital LOS in patients undergoing low-to-moderate risk surgery. Secondary outcomes included amount of fluid administered and incidence of postoperative complications.

### Methods

Patients were randomized into either PVI or PPV guided GDFT groups. Both received a baseline  $2 \text{ ml kg}^{-1} \text{ h}^{-1}$  Lactated Ringer infusion. Additional fluid boluses consisted of 250 mL of colloid that was infused over a 10 min period if PVI was  $> 15\%$  or PPV was  $> 13\%$  for at least five minutes. The primary outcome was to determine if hospital LOS, which was defined as the number of days from surgery up to the day the surgeon authorized hospital discharge, was equivalent between the two groups.

### Results

A total of 76 patients were included and they were randomized into two groups of 38 patients. Baseline characteristics were similar in both groups. Both PVI and PPV guided GDFT strategies were equivalent for the primary outcome of LOS (median [interquartile range]) (days) 2.5 [2.0–3.3] vs. 3.0 [2.0–5.0],  $p = 0.230$ , respectively. Fluids infused, postoperative complications, and all other outcomes were not different between groups.

### Conclusion

In patients undergoing low-to-moderate risk abdominal surgery, PVI seems to guide GDFT similarly to PPV in regards to hospital LOS, amount of fluid, and incidence of postoperative complications. However, in low-risk patients undergoing these surgical procedures optimizing stroke volume may have limited impact on outcome.