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Pleth Variability Index Predicts Fluid Responsiveness in Mechanically Ventilated Adults During General Anesthesia for Noncardiac Surgery.

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OBJECTIVE: To investigate whether the pleth variability index (PVI), derived noninvasively from a pulse oximeter probe, would predict fluid responsiveness in patients undergoing noncardiac surgeries.

DESIGN: A clinical, prospective, observational study.

SETTING: Operating room of a tertiary care hospital.

PARTICIPANTS: Twenty-nine adult patients undergoing a range of noncardiac surgeries, requiring general anesthesia, tracheal intubation, and mechanical ventilation.

INTERVENTIONS: Intravenous volume expansion with 500 mL of colloid following induction of general anesthesia and after a period of hemodynamic stability before the start of surgery.

MEASUREMENTS AND MAIN RESULTS: Baseline values for PVI and stroke volume index, derived from an esophageal Doppler monitor, were compared with final values after the volume expansion. Patients were classified into fluid responders and nonresponders based on a stroke volume index increase of $\geq 10\%$. The optimal cut-off value for baseline pleth variability index for predicting fluid responsiveness was determined. There were 17 responders (59%) to the 500-mL volume expansion. Baseline PVI value was significantly different between responders and nonresponders ($16.5 \pm 6.4\%$ v $10.3 \pm 2.7\%$; $p = 0.004$). Receiver operating characteristic analysis demonstrated significant predictive ability of an increase in stroke volume index for PVI with area under the curve of 0.84 (95% confidence interval = 0.69-0.99). The optimal cut-off value for baseline PVI was 10.5%, with a sensitivity of 88% and a specificity of 67%.

CONCLUSIONS: Pleth variability index is predictive of fluid responsiveness in adult patients undergoing noncardiac surgery.

