

## Dynamic variables to predict fluid responsiveness in young children

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**Background:** The evidence that dynamic variables predict fluid responsiveness in young children is limited by conflicting results.

**Methods:** Sixty patients 1-3 years of age undergoing major neurosurgery received 10 ml/kg of Ringer's solution over 10 min after anesthesia induction. Aortic blood flow peak velocity ( $\Delta V_{peak}$ ), plethysmographic variability index (PVI), FloTrac/Vigileo-derived stroke volume variation (SVV), and dynamic arterial elastance (Eadyn), and pulse pressure variation (PPV) were measured before and following fluid loading. An increase in cardiac index (CI) of  $\geq 10\%$  following fluid loading identified fluid "responders".

**Results:** Twenty-six (43.3%) patients were fluid responders. Baseline  $\Delta V_{peak}$  was an excellent predictor of a CI increase following fluid loading with an area under the receiver operating characteristic curve (AUROC) of 0.982 ( $P < 0.001$ ). PVI showed fair diagnostic accuracy for CI-fluid responsiveness (AUROC 0.775,  $P < 0.001$ ). Baseline  $\Delta V_{peak}$  and PVI cutoff values were 9.6% and 15%, respectively. PPV, SVV, and Eadyn were not or poor predictors for CI-fluid responsiveness (AUROC 0.669, 0.653, and 0.533, respectively).

**Conclusion:** Volume-based PVI and  $\Delta V_{peak}$  showed acceptable reliabilities for fluid responsiveness prediction in young children undergoing major neurosurgery, while pressure-based SVV using FloTrac/Vigileo, Eadyn, and PPV not.