

TAKE-HOME MESSAGE

What Factors Predict Fluid Responsiveness in Hemodynamically Unstable Patients?

Annals of Emergency Medicine

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INTRODUCTION:

- Aggressive resuscitation of critically ill patients may limit progression to organ failure and improve outcomes.
- However, studies have consistently demonstrated that approximately 50% of hemodynamically unstable critically ill patients are volume responsive.

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- This is significant because over-resuscitation can result in increased mortality, pulmonary edema, and acute respiratory distress syndrome.
 - Thus, the resuscitation of a critically ill patient requires an accurate assessment of volume status and the ability to predict the hemodynamic response after a fluid challenge.

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- The objective of this review was to provide summary estimates of the accuracy of various symptoms, signs, and measurements to predict fluid responsiveness in patients with hemodynamic instability.

METHODS:

- Fifty studies were identified including 2260 patients.
- The most commonly reported cause of hemodynamic instability was sepsis (median 71%; interquartile range 60% to 94%), with a median 66% of patients (interquartile range 50% to 85%) receiving vasopressors.

- ***Passive leg raising:*** is performed by placing the patient in a semirecumbent position and then adjusting the bed to an obtuse angle, with the lower section inclined to 45 degrees. Despite the statistical predictive power of this test, not all hospital beds will be able to accommodate this maneuver.

RESULTS

- Most findings on physical examination were not predictive, including skin turgor, capillary refill time, jugular venous distention, appearance of mucous membranes, pulmonary auscultation, and presence or absence of leg edema, ascites, and pleural effusions.

- Response to passive leg raise was predictive of fluid responsiveness when measured by cardiac output (positive LR 11 [95% confidence interval {CI} 7.6 to 17]; negative LR 0.13 [95% CI 0.07 to 0.22]) and pulse pressure (positive LR 3.6 [95% CI 2.5 to 5.4]; negative LR 0.45 [95% CI 0.36 to 0.57]).

- inferior vena cava distensibility in patients with ventilation and without spontaneous respiratory efforts did have discriminative ability in regard to fluid responsiveness (positive LR 5.3; negative LR 0.27).
- Conversely, studies evaluating caval distensibility in spontaneously breathing patients had high heterogeneity and wide CIs.

CONCLUSION:

- the findings of this systematic review suggest that clinicians should not rely on physical examination findings, including central venous pressure, to determine fluid responsiveness.
- Cardiac output measurement after passive leg raising is the most accurate predictor of fluid responsiveness.
- For intubated patients without spontaneous respiratory efforts, respiratory variation in pulse pressure and stroke volume is also useful.