

# Pleth Variability Index

# PVI

Pleth Variability Index (PVI®) is a breakthrough measurement that may help clinicians noninvasively and continuously assess fluid status of patients.

## Noninvasive > Continuous



- > Fluid administration is critical to optimizing patient status.<sup>1</sup>
- > Traditional methods to guide fluid administration often fail to predict fluid responsiveness.<sup>2</sup>
- > Newer methods may accurately predict responsiveness but are invasive or costly.<sup>3</sup>
- > PVI has been shown to help clinicians predict fluid responsiveness in mechanically ventilated patients under general anesthesia during surgery and in the ICU.<sup>4,5</sup>
- > PVI has been shown to help clinicians improve fluid management and decrease lactate levels compared to standard care.<sup>6</sup>

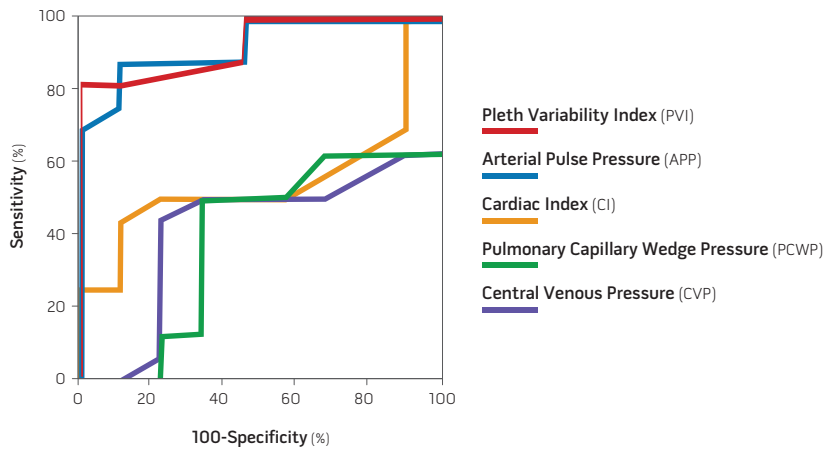
“PVI demonstrated high accuracy in discriminating fluid responders from non-responders—providing a unique opportunity to better manage a patient’s fluid volume to optimize cardiac performance and organ perfusion.”

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## CLINICAL BENEFITS



Adapted from Cannesson M. et al. *Br J Anesth* 2008;101(2):200-206.

PVI showed a similar accuracy (0.93 area under the curve) vs. pulse pressure variation from an invasive arterial catheter (0.94) and superior accuracy vs. cardiac index (0.56), central venous pressure (0.42), and pulmonary capillary wedge pressure (0.40).

PVI has been shown to help clinicians to predict fluid responsiveness in mechanically ventilated patients under general anesthesia, defined as a significant increase in cardiac output after fluid administration

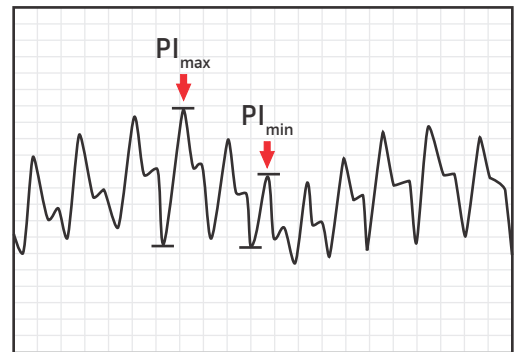
- > PVI >14% prior to volume expansion is predictive that a patient will respond to fluid administration (81% sensitivity)
- > PVI <14% prior to volume expansion is predictive that a patient will not respond to fluid administration (100% specificity)

## PVI CALCULATION: HOW IT WORKS

Perfusion Index (PI) is the ratio of nonpulsatile to pulsatile blood flow through the peripheral capillary bed. PVI is an automatic measure of the dynamic change in PI that occurs during the respiratory cycle.

$$PVI = \frac{PI_{max} - PI_{min}}{PI_{max}} \times 100$$

The greater the PVI, the more likely the patient will respond to fluid administration.



## TECHNOLOGY PLATFORM



Masimo rainbow SET® is a noninvasive monitoring platform enabling the assessment of multiple blood constituents and physiologic parameters that previously required invasive or complicated procedures, in addition to providing Masimo SET® Measure-through Motion and Low Perfusion pulse oximetry.

- > Acoustic Respiration Rate (RRa™)
- > Carboxyhemoglobin (SpCO®)
- > Methemoglobin (SpMet®)
- > Oxygen Content (SpOC™)
- > Pleth Variability Index (PVI®)
- > Total Hemoglobin (SpHb®)
- > Oxygen Saturation (SpO2)
- > Pulse Rate (PR)
- > Perfusion Index (PI)

The upgradeable rainbow SET® platform lets you choose the rainbow® measurements that are right for you now and be confident that your investment in patient safety won't become obsolete tomorrow.

### REFERENCES

- <sup>1</sup> Perel A. *Anaesth Analg*. 2008;106(4):1031-33.
- <sup>2</sup> Michard F. et al. *Chest*. 2002;121(6):2000-08.
- <sup>3</sup> Joshi G. et al. *Anaesth Analg*. 2005;101:601-5.
- <sup>4</sup> Cannesson M. et al. *Br J Anaesth*. 2008;101(2):200-6.
- <sup>5</sup> Loupec T. et al. *Crit Care Med*. 2011;39(2):294-299.
- <sup>6</sup> Forget P. et al. *Anesth Analg*. 2010;111(4):910-4.