

# DID YOU KNOW?

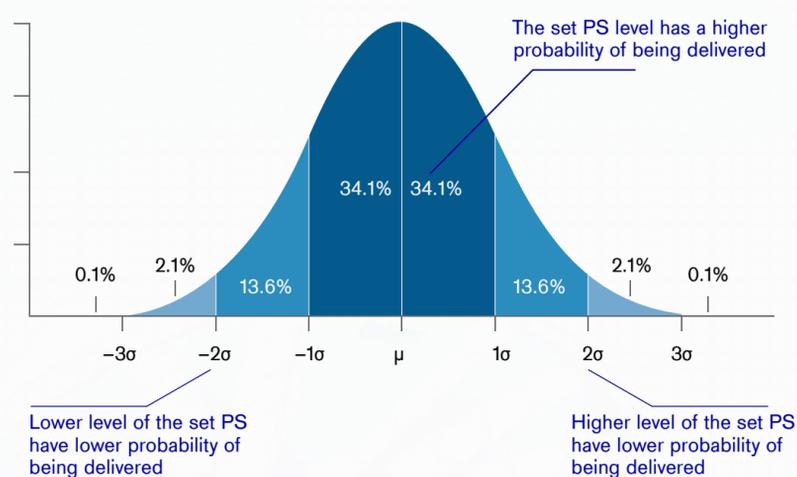


## VARIABLE PRESSURE SUPPORT VENTILATION

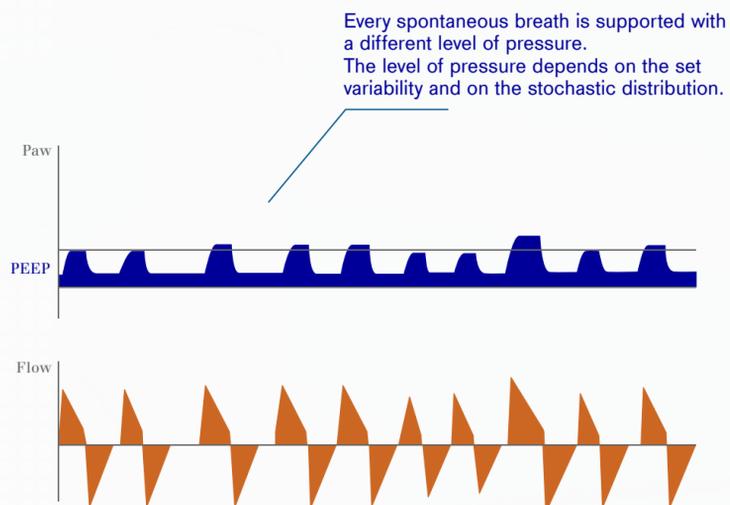
### What is it?

Variable Pressure Support works like a pressure support ventilation mode with an additional setting: **variability of PS (in %)**.

The pressure support level set by the user is kept in average with a random probability variation of the pressure support level based on statistic distribution.



The pressure support level is averaged on the PS settings but varied using Variability setting



### Which are the settings?

In addition to the normal Pressure Support settings, when Variable Pressure Support is active, the **Pressure variability knob is available**.

With this parameter it's possible to set the variability of the PS support level from 0% (no variability) to 100% (maximum variability).

Example:

Settings	Results
$\Delta P_{supp}$ 10 cmH <sub>2</sub> O	$P_{supp}$ 15 cmH <sub>2</sub> O
PEEP 5 cmH <sub>2</sub> O	$P_{supp\ min}$ 10 cmH <sub>2</sub> O
Press. Var. 50%	$P_{supp\ max}$ 20 cmH <sub>2</sub> O

### Why is it helpful to improve outcome?

Variable Pressure support can be applied to any patient in spontaneous breathing to mimic the natural variability of tidal volume in healthy subjects (approximately 33% of the tidal volume at rest<sup>1</sup>).

This variability may be beneficial **to improve function and reduce damage in the diseased lung** mainly thanks to these effects<sup>2</sup>:

- Reduction of inspiratory WOB
- Improvement in patient/ventilator synchrony
- Increase in the variability of respiratory pattern
- Weaning from mechanical ventilator

"In the very short term, noisy PSV proved safe and feasible in patients with acute hypoxemic respiratory failure. Compared to conventional PSV, noisy PSV increased the variability of tidal volumes, and was associated with improved patient-ventilator synchrony, at comparable levels of gas exchange"<sup>3</sup>

"ViPS is the first randomized controlled trial investigating whether variable, compared to nonvariable PSV, shortens the duration of weaning from mechanical ventilation in a mixed population of critically ill patients. This trial aims to determine the role of variable PSV in the intensive care unit"<sup>4</sup>

"V-PSV80 (Variable pressure ventilation with 80% of variability) includes the same increase in breathing pattern variability than NAVA, without inducing more patient-ventilator asynchrony or lung over distention"<sup>5</sup>

1. Breathing pattern in humans: Diversity and individuality, Benchetrit, 2000; Multifractality in human heartbeat dynamics nature, Ivanov, 1999  
 2. Variable ventilation from bench to bedside — Huhle et al. Critical Care (2016) 20:62  
 3. Short-term effects of noisy pressure support ventilation in patients with acute hypoxemic respiratory failure - Spieth et al. - Critical Care 2013;17:R261  
 4. Rationale and study design of ViPS — variable pressure support for weaning from mechanical ventilation: Study protocol for an international multicenter randomized controlled open trial – 2013  
 5. Comparative Effects Of Variable Pressure Support, Neurally Adjusted Ventilatory Assist (NAVA) And Proportional Assist Ventilation (PAV) On The Variability Of The Breathing Pattern And On Patient Ventilator Interaction – Morawiec et al. - Réanimation (2014) 24:S22–S25