

Parameters capable of assessing the **complete hemodynamics** of the patient: **preload, afterload and contractility**

FLOW AND PERFUSION

STROKE VOLUME

The amount of blood ejected from the left ventricle in a single heartbeat.
Physiological range at rest:
60 to 100 mL

CARDIAC OUTPUT

Volume of blood ejected from the left ventricle in one minute.
Physiological range at rest:
4 - 8 L/min

OXYGEN SUPPLY

The amount of oxygen delivered to the tissue in one minute.
Physiological range at rest:
400 to 600 mL/min/m²

PRELOADING AND FLUID RESPONSE

PULSE PRESSURE VARIATION (PPV)

Dynamic pressure changes in the respiratory cycle,
 $PPV = (PP_{max} - PP_{min}) / [(PP_{max} + PP_{min})^2] * 100$

STROKE VOLUME VARIATION (SVV)

Dynamic changes in the volume of the respiratory cycle,
 $SVV = (SP_{max} - SP_{min}) / [(SP_{max} + SP_{min})^2] * 100$

CONTRACTILITY

dP/dT_{max}

Maximum slope of the systolic rise of the blood pressure curve. It evaluates the isovolumetric contraction phase of the left ventricle. Range: 0.90 to 1.30 mmHg/msec

AFTERLOAD

ARTERIAL ELASTANCE (E_a)

Relationship between end-systolic pressure and stroke volume.
Physiological resting range of 1.10-1.40 mmHg/ml

DYNAMIC ELASTANCE (PPV/SVV)

Relationship between PPV and SVV. It has been suggested as a variable representing dynamic changes in arterial load and tone in mechanically ventilated patients.
Resting physiological range: 0.5-1.5

PULSE PRESSURE VARIATION (PPV)

Systematic vascular resistances will only tell us about the afterload, the static component of the system. Afterload is the peripheral or systemic vascular resistance to which the left ventricle is confronted by the expelling blood into the arterial system

Physiological resting range (absolute values): 800 - 1400 dynes*sec/cm⁵
Physiological resting range (indexed values): 1600 - 2400 dyne*sec*m²/cm⁵

EFFICIENCY

CARDIAC CYCLE EFFICIENCY (CCE)

Haemodynamic performance in terms of energy expenditure. It depends on the energy required to generate a which, in turn, depends on the interaction between LV function and the arterial system, i.e., the V/A coupling.

Range: -0.2-.3