# Hemodynamic Normal Values

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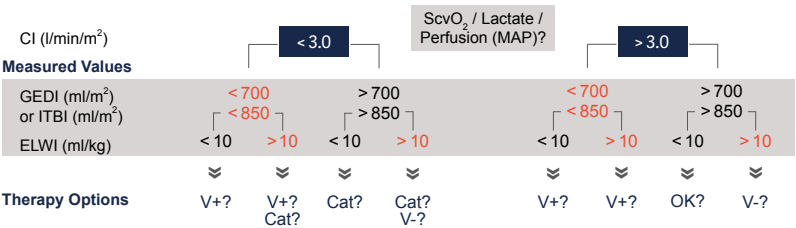
| | | Central Venous Oxygenation - Oxygenation Balance (Oxygen load of the venous blood after passing through the organs) | $ScvO_2$* | 70-80 % |
| | | $O_2$ Consumption ($O_2$ consumption by organs) | $VO_2I$ | 125-175 ml/min/m² |
| Oxygen Delivery | | $O_2$ Delivery ($O_2$ delivery via blood to organs) | $DO_2I$ | 400-650 ml/min/m² |
| Oxygen Delivery | | Hemoglobin (Oxygen transporter in blood) | Hb** | 8.7-11.2 mmol/l (Male)<br>7.5-9.9 mmol/l (Female) |
| Oxygen Delivery | | Arterial / capillary oxygen saturation (Oxygen load of arterial blood) | $SaO_2$ / $SpO_2$ | 96-100 % |
| Oxygen Delivery | Flow | Cardiac Index (Trend, CaI, td, PC) | CI | 3.0-5.0 l/min/m² |
| Oxygen Delivery | Chronotropy | Heart Rate/Pulse Rate | HR/PR | 60-100 1/min |
| Oxygen Delivery | Stroke Volume | Stroke Volume Index (Output per heart beat) | SVI | 40-60 ml/m² |
| Oxygen Delivery | Stroke Volume – Preload | Global Enddiastolic Volume Index (Volume of blood in the heart) | GEDI | 680-800 ml/m² |
| | | Intrathoracic Blood Volume Index (Volume of blood in heart & lungs) | ITBI | 850-1000 ml/m² |
| | | Stroke Volume Variation (Dynamic fluid responsiveness) | SVV*** | <10 % |
| | | Pulse Pressure Variation (Dynamic fluid responsiveness) | PPV*** | <10 % |
| | Stroke Volume – Afterload | Systemic Vascular Resistance Index (Resistance of vascular system) | SVRI | 1700-2400 dyn*s*cm⁻⁵*m² |
| | | Mean Arterial Pressure | MAP | 70-105 mmHg |
| | Stroke Volume – Contractility | Global Ejection Fraction (Ratio of stroke volume & preload) | GEF | 25-35% |
| | | Left Ventricular Contractility (Increase of arterial pressure over time) | dPmx | Trend info - mmHg/s |
| | | Cardiac Function Index (Ratio of CI and preload) | CFI | 4.5-6.5 1/min |
| | | Cardiac Power Index (Global cardiac performance) | CPI | 0.5-0.7 W/m² |
| | Lung | Extravascular Lung Water Index (Lung edema) | ELWI | 3.0-7.0 ml/kg |
| | | Pulmonary Vascular Permeability Index (Permeability of lung tissue) | PVPI | 1.0-3.0 |

Absolute values (non-indexed values) are only usable in trend screens and have no normal range. *A high-normal / high $ScvO_2$ can be a sign of insufficient $O_2$ utilization **14-18 g/dl (Male); 12-16 g/dl (Female) ***SVV and PPV are only applicable in fully ventilated patients with a tidal volume ≥ 8 ml/kg PBW (predicted body weight) and without cardiac arrhythmias

# Hemodynamic Decision Model

**NOTE:** PULSION Medical Systems is a medical device manufacturer and does not practice medicine. PULSION does not recommend these values for use on a specific patient. This decision model is not obligatory.




V+ = volume loading
V- = volume withdrawal
Cat = catecholamine / cardiovascular agents

Please reevaluate your clinical decisions and the set target parameters.

**Targeted Values**

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|---|---|
| • GEDI (ml/m²) (if ELWI >10 → 700-800) | > 700 |
| • GEF (%) | > 25 |
| • CFI (1/min) | > 5 |
| • ELWI (ml/kg) (slow response) | ≤ 10 |

- Volume Responsiveness? (Passive Leg Raising / Endexpiratory Occlusion Test / Volume Challenge / SVV / PPV?)
- Contractility Problem? (GEF / CFI / Echo?)



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