PiCCO AS ALTERNATIVE CARDIAC OUTPUT MONITOR

Dr. Ashraf EL Masry
Lecturer of Anesthesia, Faculty of medicine, Cairo University

PiCCO relies on two technologies used to monitor cardiac output. The thermodilution technique (similar to pulmonary artery catheter) and pulse contour analysis. The thermodilution technique requires a central venous catheter where saline (indicator) is injected and thermal noise is collected via a special arterial catheter, using the Stewart Hamilton equation. The measured cardiac output using the thermodilution technique is then used to calibrate the pulse contour analysis technique which is used to continuously monitor cardiac output.

Parameters obtained from PiCCO monitor can be classified into parameters obtained from thermodilution technique and parameters obtained from pulse contour analysis.

Parameters obtained from thermodilution:
Cardiac output (CO).
Global end diastolic volume (GEDV).
Intra-thoracic blood volume (ITBV).
Extra vascular lung water (EVLW).
Pulmonary vascular permeability index (PVPI).
Cardiac function index (CFI).
Global Ejection fraction (GEF).

Parameters obtained from pulse contour analysis:
Pulse contour cardiac output (PCCO).
Arterial blood pressure (ABP).
Heart rate (HR).
Stroke volume (SV).
Stroke volume variation (SVV).
Pulse pressure variation (PPV).
Systemic vascular resistance (SVR).
Index of left ventricular contractility index (dpmx).

Since PiCCO requires only both central venous and arterial catheters, it can be used in infants, parameters obtained are easy to use and interpret and also lung edema can be quantified at the bed side; renders such monitor an attractive option in cardiac surgery.