

Hemodynamic Monitoring with the Transpulmonary Thermodilution Technique, The best is yet to come

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Over the last decade, the single transpulmonary thermodilution (TPTD) technique was implemented in clinical practice to measure cardiac output and preload parameters. The technique has started to supplant the Swan-Ganz catheter as many European surveys highlight the widespread use of this variety of hemodynamic monitoring tool. The technique was also the subject of many studies and scientific considerations as reflected in the number of publications in the index medicus. The cardiac output measured by this method (CO^{TPTD}) is determined using the Stewart-Hamilton equation applied to a thermodilution curve as it is the case when using a Swan-Ganz catheter. Except that in comparison to the right heart thermodilution curve, the TPTD curve is obtained by the injection of the thermal indicator into a central intra-thoracic vein instead to the right atrium and the thermal shift is collected via an arterial catheter placed in a large systemic arterial trunk (aorta, axillary or brachial artery) instead of the pulmonary artery. The result is that TPTD can be used to derive preload parameters like global end diastolic volume and intrathoracic blood volume. Moreover, as a transpulmonary transit of the cold indicator occurs, after some calculation and subtraction, using the present technique, we may calculate pulmonary blood volume and extravascular lung water. The purpose of this tutorial is to review and assess the existing data related to the relevance of this technique as advanced hemodynamic monitoring.