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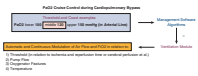

CRUISE CONTROL MANAGEMENT FOR ARTERIAL OXYGEN TENSION ON EXTRACORPOREAL TECHNOLOGIES

To the Editor:

Peripheral tissue perfusion is disturbed and reduced during hypothermic cardiopulmonary bypass (CPB) with both a reduced flow and a continuous flow pattern. This disturbance has also been demonstrated by lower average oxygen tension in skeletal muscle. Under such circumstances, it may be tempting to assume that a supernormal Pao_2 would provide improved oxygen delivery to peripheral tissue and an increased margin of safety, and therefore Pao_2 is kept above normal values. Hyperoxemia also disturbs and reduces tissue oxygenation in healthy subjects under normal resting conditions, as well as in mechanically ventilated critically ill patients. This is seen as an increase in the range of tissue oxygen tensions of different adjacent capillary regions, where some extremely low values are observed.[1] Intelligent systems and algorithmic supports are widely established and considered indispensable in the safety systems integrated into the extracorporeal consoles that regulate CPB and extracorporeal membrane oxygenation.[2] Many studies on the management of Pao_2 during CPB have been carried out without the use of a continuous parameter monitoring technology; today, the technology offers several solutions for continuous monitoring of both measured and calculated Pao_2.[1] These new technologies allow, with the integration of specific management algorithms, what is essentially cruise control management of Pao_2—that is, keeping the normoxia or hyperoxia value constant during the procedure, in relation to flow variables such as ventilation, temperature, ischemia-reperfusion, and oxygenator features. In the future, cruise control; that is, the use of an integrated management algorithm in the ventilation module on CPB in arterial oxygen and carbon dioxide tension management, could open new perspectives.

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