

LACTATE IN INTENSIVE CARE: ROOM FOR A NEW SENSOR!

1 Supervising staff

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2 Context

Intra-arterial lactate measurement in Intensive Care Unit (ICU) patients with sepsis is of major interest due to its role as a key biomarker of tissue hypoperfusion (hypoxia) and disease severity. Elevation of lactate is associated with increased mortality, while its progressive clearance is an indicator of a favorable response to treatment. The arterial route offers increased accuracy, a more representative measurement of global hemodynamic status, and allows continuous monitoring, which is particularly useful in a critical setting.

Compared to venous measurement, arterial measurement is less influenced by local processes and better reflects systemic perfusion. It is often feasible due to the presence of arterial lines already in place for intensive care. This tool helps guide hemodynamic resuscitation, detect septic shock early, and monitor the effectiveness of therapeutic interventions such as fluids, vasopressors, or oxygenation adjustments.

However, lactate interpretation must take into account metabolic processes unrelated to hypoperfusion, and its use requires clinical expertise. Although the method is invasive, the advantages in terms of rapid decision-making and personalized care make it a valuable tool for optimizing the management of patients with sepsis and improving their chances of survival.

3 Work

Propose a sensor measuring lactate continuously, which would be placed at the end of catheters already used to measure other parameters such as blood pressure in real time.

This work requires a chemical-biochemical approach, microelectronics and signal processing.