

Multi-Detector Near-Infrared Spectroscopy Probe for Monitoring Cerebral Oxygenation in Preterm Infants

A novel near-infrared spectroscopy (NIRS) probe designed for preterm and low-birth-weight infants enables more accurate, non-invasive monitoring of cerebral oxygenation by accounting for anatomical variability in neonatal brain structure.

What is the Problem?

Preterm infants are at high risk for brain injury due to unstable oxygen delivery and blood flow in the first hours and days after birth. Clinicians rely on near-infrared spectroscopy (NIRS) to monitor cerebral oxygenation, but current devices often produce inconsistent readings in neonates due to anatomical differences such as small head circumference and immature brain structures. These inaccuracies can lead to misinterpretation of cerebral oxygenation status and limit the clinical utility of NIRS in neonatal intensive care units (NICUs). There is a need for monitoring tools that are specifically calibrated for the unique physiology of preterm infants.

What is the Solution?

This technology introduces a multi-detector NIRS probe optimized for use in preterm and low-birth-weight neonates. The probe uses multiple detectors to capture light absorption at different depths and regions of the brain, improving spatial resolution and reducing signal variability. By integrating data from three distinct detectors, the system can better distinguish between signals originating from superficial tissues, ventricular spaces, and deeper cerebral structures. This approach enhances the accuracy of regional cerebral oxygenation measurements and provides clinicians with more reliable data to guide interventions. The probe is designed to be compatible with existing NIRS systems and can be used cot-side in NICU settings.

What is the Competitive Advantage?

- Tailored for Neonatal Anatomy: Accounts for head circumference and gestational age, improving accuracy in infants with small or variable cranial structures.
- Multi-Detector Configuration: Enhances depth sensitivity and spatial resolution compared to single-detector systems.

Technology ID

BDP 8532

Category

Device/Imaging
Selection of Available
Technologies

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-Improved Signal Interpretation: Reduces the likelihood of misinterpreting signals from cerebrospinal fluid or ventricular spaces as cerebral tissue oxygenation.

-Clinical Integration: Compatible with standard NIRS platforms and designed for real-time use in NICU environments without requiring significant workflow changes.

Patent Information:

[WO2024118999A1](#)

References

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