88A Low-Cost Compact Flow-Oximeter for Monitoring of Cerebral Hemodynamics and Metabolism in Neonatal and Infant Brains - 2118

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Technology description

Market Opportunities

Intermittent hypoxemia (IH) is typically a consequence of immature respiratory control in preterm infants. The need to stabilize oxygenation in neonatal intensive care has been recognized as a significant clinical problem. Currently, finger pulse oximetry (PO) is the standard of care for continuous monitoring of frequency and magnitude of IH in a majority of neonatal intensive care units (NICUs). Because the sensor is located on the finger, there are many false alarms due to motion artifacts and low blood perfusion in the peripheral body area. There remains a need in the field for a more accurate representation and monitoring of IH in neonates. Diffuse correlation spectroscopy (DCS) and coherent near-infrared (NIR) point source illumination are emerging optical modalities that can be useful in monitoring cerebral blood flow without ionizing radiation effects. However, these techniques require lengthy techniques, are sensitive to motion artifacts and ambient light, and are still quite expensive.

Technology Solution

Researchers at the University of Kentucky have developed a miniaturized, easy to use, high throughput diffuse speckle contrast flow-oximeter (DCSFO) sensor for rapid, continual monitoring of both CBF and cerebral oxygenation in neonates and infants. Recent development and validation of diffuse speckle contrast flowmeter (DCSF) has provided for an accurate, noninvasive means for direct measurement of tissue blood flow variations in relatively deep tissues. The methodology provides for a more continuous, faster and simpler means for measurement. Furthermore, the low-cost invention is nonionizing and simple to use.

Application area

Biomedical Device
Pediatrics

Advantages

May provide for a device that can perform noninvasive, direct measurements of tissue blood flow variations in relatively deep tissue
May provide greater efficiency and simplicity in monitoring cerebral hemodynamics
May reduce cost and time in monitoring cerebral hemodynamics

Institution

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