

## COMPARING DIFFERENT NIRS DEVICES AND THEIR SENSORS FOR MONITORING REGIONAL CEREBRAL OXYGEN SATURATION IN NEONATES

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**Background and aim:** Near-infrared spectroscopy (NIRS)-monitored regional cerebral oxygen saturation (rScO<sub>2</sub>) in neonates has been increasingly used to assess cerebral oxygen delivery and extraction. Consequently neonatal sensors were designed with their own algorithms to separate the signals of oxy- and deoxyhemoglobin. However, published reference values are mostly based on studies using adult (conventional) sensors with different algorithms.

To compare rScO<sub>2</sub> values between the conventional NIRS-sensors of 3 different brands and those especially designed for use on the neonatal head.

**Methods:** 56 neonates admitted to our NICU were included. rScO<sub>2</sub>'s were measured left and right fronto-parietally with a conventional and neonatal sensor on each side for at least one hour.

Then the sensors were switched to the opposite side and measurements were continued for at least another hour.

**Results:** We found a significant correlation between conventional and neonatal sensors ( $p < 0.01$ - $p < 0.001$ ). However, Bland-Altman analysis showed a consistent difference between sensors from 8-to-13%, showing higher values obtained with the neonatal sensors.

**Conclusions:** Although a good correlation between conventional and neonatal NIRS sensors was detected, reference values should be re-established when using newly designed neonatal sensors.

Moreover rScO<sub>2</sub> values in the higher range measured with neonatal sensors appeared to be less reliable which may be a problem in case of hyperoxia, which is in particular a problem in the extremely preterm neonate whose brain is prone for hyperoxic-induced brain damage.