

Function near-infrared spectroscopy as a clinical outcome tool?



Background: A newly emerging optical neuroimaging technique – functional near-infrared spectroscopy (fNIRS) - is able to assess cortical activity by measuring the haemodynamic response. This is based on the principle of “neurovascular coupling”, which states that neuronal activation is coupled to the vascular response of the human brain. In the past two decades, fNIRS has become a widely accepted tool in the neuroimaging community as a tool to assess functional cortical activity patterns.

Studies have shown that children with CP have more problems with motor learning in comparison with healthy children, specifically with implicit learning. This statement demands more research on the neurophysiological processes behind motor learning, where cortical activity might play an important role. Monitoring the cortical activity patterns of these children throughout rehabilitation might provide insights into the neurophysiological processes of motor learning and neural reorganisation in children with CP.

However, in order to introduce fNIRS as a routine assessment tool in neurorehabilitation, the connection between cortical activity patterns and functional outcome after rehabilitation has to be established.

Goal

- To measure cortical activity patterns in healthy adults and healthy children performing passive and active limb movements, using a robotic finger rehabilitation device.

Project onset

2014

Project members

- Rob Labruyère
- Volker Ressel
- Huub van Hedel