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Probing the Neural Mechanisms of Post-Anesthesia Care Unit Delirium Using Functional Near-Infrared Spectroscopy

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Mentored Research Training Grant (MRTG)

7/1/2019

Delirium is a common condition seen after the surgical experience, primarily affecting older and neurocognitively frail patients. Currently delirium is a clinical diagnosis, and prevention and treatment strategies focus largely on modifying behaviors, including orienting patients and promoting normal sleep cycles. While there remains a need to better understand the underlying neural mechanisms of delirium, it is difficult to assess delirious patients that are recovering from anesthesia. Recently, functional near-infrared spectroscopy (fNIRS) has been developed as a portable and safe non-invasive brain imaging technique that can be used in a variety of patient populations, from infants to elderly adults. fNIRS uses light to estimate brain activity and can identify changes in cerebral blood flow across multiple areas of the brain. Using fNIRS, this study seeks to develop fundamental knowledge about the underlying brain activity in delirious patients. With novel approaches to neuroimaging such as fNIRS, it may be possible to identify biomarkers for delirium, ultimately aiding in better identification of at-risk patients and more tailored treatments.