Integrated Traumatic Brain Injury Catheter (iTBI)

Technology #20180031

Integrated redundant pressure transducers, multi-focal stimulating and monitoring electrodes

A new traumatic brain injury (TBI) catheter features an extra ventricular drain (EVD) with integrated redundant pressure transducers and multi-focal electrical stimulating and monitoring electrodes. The following innovations address the new era of traumatic brain injury neurocritical care:

Two independent, continuous pressure transducers. Built into the tip of the EVD catheter, the transducers can be used in a variety of arrangements (e.g., bidirectional lateral, and/or one lateral and one facing the axis of placement).

Integrated electrodes. Electrodes, placed for optimal sensing of cortical spreading depression and seizures in addition to stimulation, can be:

- segmented around the axis of the catheter to provide directional information
- concentrically segmented along the long axis of the catheter to select optimal channels for detecting cortical spreading depression
- optimized for stimulation of reach and bipolar configuration through segmentation and surface area

Dramatically improved external ventricular drain design

Currently, external ventricular drains (EVDs) cannot measure cortical spreading depression (depolarization), associated with migraine, seizure, stroke, hemorrhage. Existing catheters simply drain cerebrospinal fluid (CSF) and provide a single pressure transducer at the tip of the catheter. This new catheter design includes electrodes that detect and potentially treat seizures and cortical spreading depression. By providing the ability to record seizures and cortical spreading depression, including directionality, this device dramatically improves the utility of the external ventricular drain. In addition, much needed redundancy built into the device improves the ability to measure intracranial pressure and assess cerebral autoregulation.

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Phase of Development

- Prototype

Benefits

- Dramatically improves utility of external ventricular drain
- Improves ability to measure intracranial pressure and assess cerebral autoregulation

Features

- Records cortical spreading depression, including directionality
- Allows detection and possible treatment of seizures and cortical spreading depression

Applications

- Traumatic brain injury
- Severe head trauma
- Neurosurgery
- Medical devices

Interested in Licensing?

The University relies on industry partners to scale up technologies to large enough production capacity for commercial purposes. The license is available for this technology and would be for the sale, manufacture or use of products claimed by the issued patents. Please contact Kevin Nickels to share your business needs and technical interest in this technology and if you are interested in licensing the technology for further research and development.

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