INNOVATION PARTNERSHIPS
UNIVERSITY OF MICHIGAN

Digital External Ventricular Drain (DEVD) with Data Analytics Integration

TECHNOLOGY NUMBER: 7397

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Category
Medical Devices
Software
Life Sciences

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OVERVIEW

Digital extra-ventricular drain (EVD) monitor/pressure regulator

- Provides automated adjustments for changes in ICP, CSF flow, and patient position
- Digitally stores and interprets ICP and CSF flow data over multiple time periods

BACKGROUND

Accurate intracranial pressure (ICP) monitoring is essential to evaluating and treating traumatic brain injury (TBI) during the early hours of care. Evidence suggests that accurate ICP monitoring after primary decompressive craniectomy for TBI patients may significantly decrease in-hospital mortality. These measures are also critical in the rapidly changing environments common during patient transport or in field hospitals, as well as in ICU settings. The existing methods for monitoring and evaluating pressure are primitive and commonly consist of a collecting bag and pressure manometer. These systems require the caregiver to regularly evaluate data and to provide manual adjustments for any change in patient position or condition. Errors in monitoring or adjustments can lead to excess CSF losses or failure to recognize increasing ICP, leading to clinical deterioration of the patient.¬†Therefore, a need exists for the ability to measure ICP while quantifying and regulating the flow of CSF in real time.

INNOVATION

Researchers have invented a digital extra-ventricular drain (DEVD) that improves the accuracy of intracranial pressure (ICP) and cerebrospinal fluid (CSF) flow measurements and control while monitoring patient position and providing real-time alerts to caregivers when changes occur.

The device fits well into current workflows, allowing for easy integration, and provides caregivers with advanced options to deliver specific, individualized care to their patients. Since the device automatically adjusts to changing patient position and CSF flow, it decreases caregiver workload and eliminates the need for manual adjustments. The fully automated processes therefore provide a safety net by alerting the caregiver of changing conditions in a timely manner. The innovators have successfully built and bench tested a prototype of the device with advanced analog input (A/D) board integration. This self-contained DEVD prototype is also manufactured with throwaway tubing and chambers to eliminate the need for sterilization between patient uses. The DEVD will prove valuable in intensive care units, during times of patient transport, and in field hospital settings.

PATENT APPLICATION

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