Skysong Innovations
Advancing the Arizona State University Knowledge Enterprise

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Wireless Fully-Passive Pressure Sensor

External ventricular drainage (EVD) is considered to be the standard of care for CSF diversion and intracranial pressure (ICP) monitoring. However, EVD is an invasive procedure that requires the placement of a catheter into a hole drilled into the cranium. The catheter monitors pressure gradients in many spaces such as intraventricular, intraparenchymal, and subarachnoidal spaces. However, EVD can displace intracerebral structures, and has been known to trigger subinkarceration in some patients. Further, it puts the patient at risk for infections and hemorrhages.

Researchers at Arizona State University have developed a novel fully passive device for the measurement of intracranial pressure. This subcutaneous, MEMS-based device provides a less invasive means for measuring and recording relevant and accurate pressure data. Unlike EVD, this device has no wires, battery, or complicated and power-consuming electronics. The implanted sensor changes its impedance upon pressure fluctuations and communicates wirelessly to an outside reader.

This implantable pressure sensor requires no battery, wires or complicated electronics and more importantly no burr hole making it a safer and better alternative to the current standard of care.

Potential Applications

- ICP Monitoring

Benefits and Advantages

- Flexible and small footprint
- Fully passive
- Wireless and battery-free (which are bulky and maintenance-prone)
- No complicated and power-consuming electronics
- Subcutaneous placement is less invasive and has fewer risks than EVD

- Accurate and relevant results

For more information about the inventor(s) and their research, please see

Dr. Chae's departmental webpage

Dr. Chae’s laboratory webpage