

Smart Brain Shunt

Summary

This invention pertains to a brain shunt system that provides enhanced control of cerebrospinal fluid pressure within a patient's brain. Innovative features of the *Smart Brain Shunt* enhance the standard shunt model by providing active blockage protection and continuous monitoring opportunities.

Inventor

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Field

Neurology;
Neurosurgery

Technology

Shunt Systems
Including Luminal
Rotators

Key Features

- Treatment providing reduced shunt obstruction and risk of infection
- Active monitoring
- Simple external pump adjustments
- Self propelled
- Small footprint

Stage of Development

Discovery

Status

Available for Licensing

Patent Status

Provisional

Contact

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Market

Shunt systems can be used to treat a variety of medical conditions. One such medical condition is hydrocephalus, which is an abnormal accumulation of cerebrospinal fluid (CSF) within a patient's brain. To treat hydrocephalus, a shunt system can be placed between ventricles of the patient's brain and another area of the patient's body (e.g., peritoneal cavity, right atrium, pleural cavity, gall bladder, and/or the like) to allow CSF to drain from the patient's brain to the other area of the patient's body.

One of the most commonly encountered pediatric neurosurgical diseases is hydrocephalus.¹ 1-2 of every 1,000 babies are born with hydrocephalus and require some form of a shunt.² Hydrocephalus can happen at any age and is the diagnosis in approximately 75,000 hospital discharges a year.³ The placement of a ventricular shunt is the primary treatment of hydrocephalus. Unfortunately, 10% of shunts require revision surgery and this is most commonly due to blockage of the ventricular catheter.²

According to the National Hydrocephalus Foundation, "CSF shunting procedures account for approximately \$100 million health care spending in the United States alone - half of this amount is spent on shunt revisions."³

This device offers the potential to reduce the number of revision surgeries and provide an active monitoring solution.

Technology

This technology pertains to a brain shunt that provides active protection from blockages. The device consists of a minute copper coil tube, and housed within the lumen of the tube is a rotating pump. The pump can be relocated, and obstructions can be cleared as needed without surgery. The device requires no power supply as it uses external magnetic forces to drive the pump. Wireless digital pressure sensors transmit signals for constant assessment of the CSF intracranial pressure. The small design allows for minimal tissue displacement.

1. Neurosurgical Shunts and their Complications, Neurology MedLink. Accessed at: http://www.medlink.com/article/neurosurgical_shunts_and_their_complications
2. National Institute of Neurological Disorders and Stroke, Hydrocephalus Fact Sheet. Accessed at: <https://www.ninds.nih.gov/Disorders/Patient-Caregiver-Education/Fact-Sheets/Hydrocephalus-Fact-Sheet>
3. National Hydrocephalus Foundation, Facts about Hydrocephalus. Accessed at: <http://nhfonline.org/facts-about-hydrocephalus.htm>