Registration Form

TEAM INFORMATION

Team Name/Project Title: Team Name: IV Brain, Project Title: A Pediatric Medical Device to Stabilize an Intraventricular Infusion Needle for the Treatment of Batten Disease

Department: Bioengineering

Faculty Advisors: Cassandra Howard, Steve Lammers

Team Members: Kai Sabio, Stephanie Gedney, Ryan Gerstenberger, Shane Weatherford

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PROJECT INFORMATION

Description:

There is a need to stabilize a sterile infusion device to pediatric patients' intraventricular reservoir port that allows for patient mobility in infusions over four hours.

Abstract:

The intraventricular infusion system, although effectively delivering enzyme therapies, still poses multiple problems when used for infusions that last over 4 hours, specifically, the issue of needle stability. Both the Ommaya and Kogman reservoirs, normally utilized for intraventricular infusions, are relatively shallow compared to the length of 90° infusion needles. Thus, a majority of the needle is not inserted within the reservoir, but extends above the scalp. This poses two problems: maintaining sterility of the needle entrance site is now difficult, as well as ensuring the needle is secured.
In the current treatment method, the needle can easily slip out of the reservoir. When this occurs, the replacement enzyme continues to be dispensed, but now over the head of the patient, rather than inside the reservoir. This not only means the loss of an expensive drug, but results in incomplete enzyme therapy. Even the turning of the head on the pillow can dislodge the needle, much less the playing, eating, and other activities.

Thus, the problems proposed to be solved are multiple, and are all significant in their impact. In order to meet these needs, an adjustable stabilization device is proposed as a solution. The device shall allow for proper placement and securement of a 90° infusion needle into an intraventricular reservoir and shall be adjustable to accommodate patients ranging from infants to adults. It is also proposed, if possible, to indicate leakage or displacement of the needle.